



IV. Mathews County Today and Tomorrow: Conditions, Opportunities, Policies and Strategies

Public Facilities & Services: Special Action Projects

Public facilities and services provide the supporting infrastructure for many important governmental activities that citizens and visitors need. The following paragraphs discuss some initial projects that can assist the County in progressing toward the established goals and strategies for Public Facilities and Services.

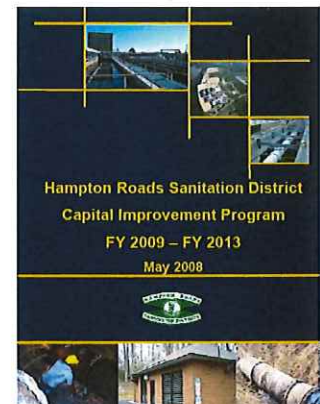
Telecommunications and Broadband

High-speed broadband and cutting-edge telecommunication technology are important to businesses and citizens. The broadband initiative is a County priority with many governmental and private partners involved in expanding services. Continued improvements in telecommunications and broadband should be promoted.



Water and Sanitary Sewer Improvements

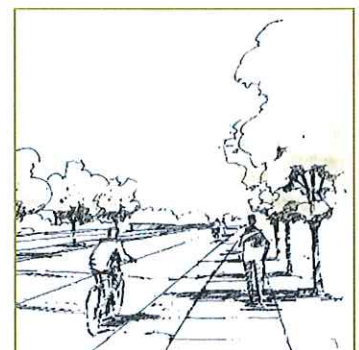
Implementation of Phase 1 of the Mathews Sanitary Sewer Transmission Force Main will provide better wastewater management in Mathews Court House, and potentially in the Hudgins and Cobbs Creek/Dixie communities. In addition, implementation will provide expanded opportunities for managing additional development along the project corridor. Options should be pursued for including conduit for broadband within the corridor, as well as considering bicycle or pedestrian trails within the right-of-way corridor. Both options provide public benefits and can be incorporated easily into the project.



Another public facility investment for the County could be a public water system to serve Mathews Court House. This project has been under consideration for several years. Other water supply projects that could be initiated may include: more stringent County standards for community water systems, well-protection measures, and increased septic system pump-out programs.

Bike Route Planning

Signage of significant bike routes may be one means of increasing public awareness of bicyclists and identifying designated biking corridors within the County. Funds are available through VDOT to assist in this signing effort.





*IV. Mathews County Today and Tomorrow:
Conditions, Opportunities, Policies and Strategies*

Environment

The environment of Mathews County is the major contributor to the overall quality of life and general economy of the County. The area's natural resources – waterways, shorelines, wetlands, forests, fields, flora and fauna provide sustenance and quality recreation for County residents, businesses and visitors. The County is fortunate to be adjacent to the Chesapeake Bay. Yet, this exceptional resource requires careful and meticulous planning and oversight to maintain its environmental features and sensitive ecosystem.



The public responsibility for protecting environmental quality and maintaining the delicate balance between nature and development lies with many local, state and federal agencies who must work collaboratively. Citizens and businesses also have an important responsibility to protect and maintain the quality of the environment in the County. Often, that recognition for environmental stewardship and pursuit of the common good falls secondary to personal interests; consequently, public education and regulatory controls are the tools most used to achieve established goals and benchmarks.

Mathews County should be and can be a model community for environmental stewardship and protection; its proud maritime heritage and prosperity has provided a stable foundation for generations and should continue fostering future generations. The quality of life that Mathews' residents enjoy today, and have enjoyed for generations, depends on strong environmental leadership.



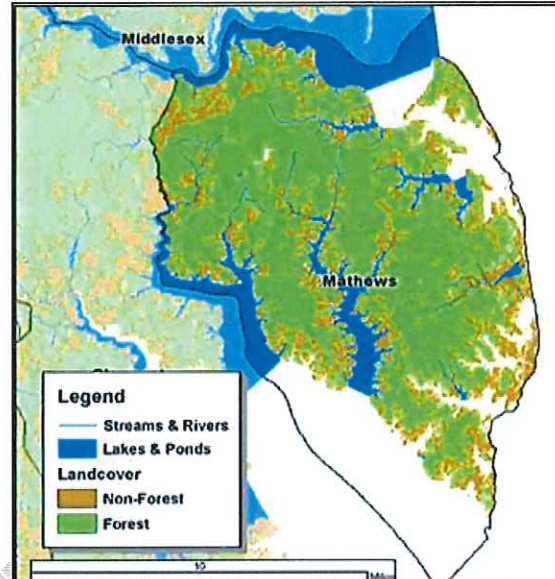


IV. Mathews County Today and Tomorrow: Conditions, Opportunities, Policies and Strategies

Forests and Agriculture

Based on information available from the Virginia Department of Conservation and Recreation and the Virginia Tech Department of Forestry, approximately 62% of the land cover in Mathews County is forest. These forests are privately owned. Forests are comprised of four different types: loblolly-shortleaf pine; oak-pine; oak-hickory; and oak-gum-cypress. The top ten species are loblolly pine, American holly, sweetgum, red maple, swamp tupelo, sourwood, blackgum, black cherry, hornbeam, and sassafras.

Over the past several decades there has been increased harvesting of these forests for lumber to meet market demands. In addition, changes in the water table and natural vegetative succession have affected forested lands, diminishing County resources.



Source: Virginia Department of Forestry 2003.

Of importance worthy of greater conservation efforts are the maritime forests of Mathews County. These forests are important coastal habitats that are now challenged by rising sea levels, erosion and land subsidence. They are important because of their ability to tolerate salinity, stabilize soils, withstand coastal storms, and provide refuge habitat. The documented maritime forests in Mathews County are shown on the map on the following page.

In addition to forests, much of the soils in the County are valued as important to agriculture. Unfortunately, poor drainage has diminished the value of some of these areas. The most productive soils are located near the shorelines of the County. These prime agricultural soils are shown on the map following the Maritime Forests map. "Prime farmland" has the best physical and chemical characteristics for producing crops.

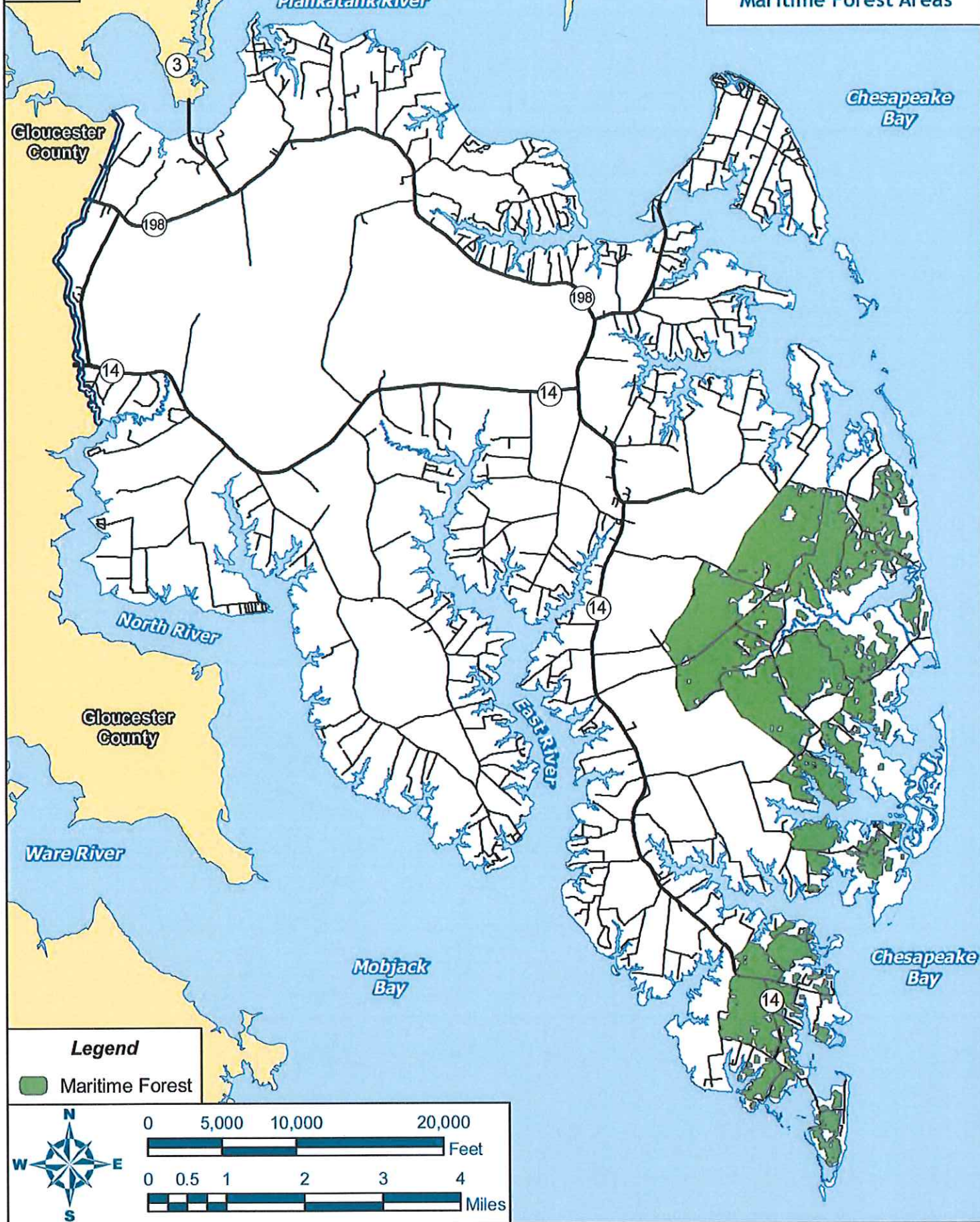


Middlesex County

Mathews County
Comprehensive Plan
2030



Maritime Forest Areas



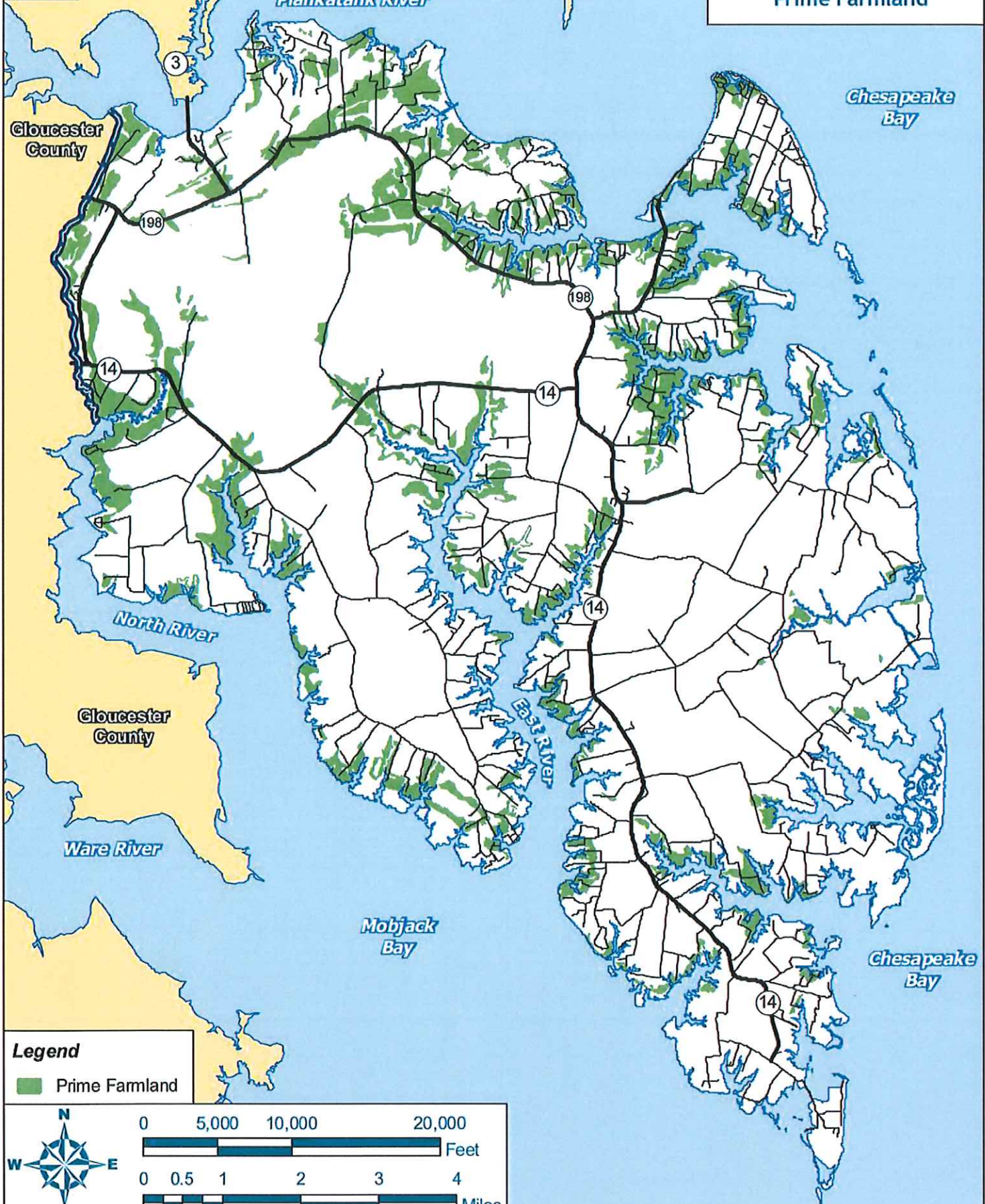


Middlesex
County

Mathews County
Comprehensive Plan
2030

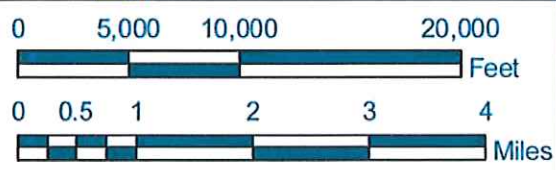


Prime Farmland



Legend

■ Prime Farmland





*IV. Mathews County Today and Tomorrow:
Conditions, Opportunities, Policies and Strategies*

Coastal Resource Management

Coastal ecosystems reside at the interface between the land and water, and are naturally very complex. They perform a vast array of functions by way of shoreline stabilization, improved water quality, and habitat for marine organisms; from which humans derive direct and indirect benefits.

The science behind coastal ecosystem resource management has revealed that traditional resource management practices limit the ability of the coastal ecosystem to perform many of these essential functions. The loss of these services has already been noted throughout coastal communities in Virginia because of development in coastal zone areas coupled with common erosion control practices. Beaches and dunes are diminishing due to a reduction in a natural sediment supply. Wetlands are drowning in place as sea levels rise and barriers to inland migration have been created by construction of bulkheads and rip-rap revetments. There is great concern on the part of the Commonwealth that the continued armoring of shorelines and construction within the coastal area will threaten the long-term viability of coastal ecosystems under current and projected sea level rise.

In the 1980s, interest arose in the use of planted wetlands to provide natural shoreline erosion control. Today, a full spectrum of living shoreline design options is available to address the various energy settings and erosion problems found. Depending on the site characteristics, they range from marsh plantings to the use of rock sills in combination with beach nourishment. Research continues to support that these approaches combat shoreline erosion, minimize impacts to the natural coastal ecosystem and reinforce the principle that an integrated approach for managing tidal shorelines enhances the probability that the resources will be sustained. Therefore, adoption of new guidance and shoreline best management practices for coastal communities is now necessary to ensure that functions performed by coastal ecosystems will be preserved and the benefits derived by humans from coastal ecosystems will be maintained into the future.

In 2011, the Virginia Assembly passed legislation to amend §28.2-1100 and §28.2-104.1 of the Code of Virginia and added section §15.2-2223.2, to codify a new directive for shoreline management in Tidewater Virginia. In accordance with section §15.2-2223.2, all local governments shall include in the next revision of their comprehensive plan beginning in 2013, guidance prepared by the Virginia Institute of Marine Science (VIMS) regarding coastal resource management and, more specifically, guidance for the appropriate selection of living shoreline management practices. The legislation establishes the policy that "living shorelines" are the preferred alternative for stabilizing eroding shorelines. This guidance, known as Comprehensive Coastal Resource Management Guidance, is being prepared by VIMS for localities within the Tidewater region of Virginia and shared through their Comprehensive Coastal Resources Management Portal (CCRMP). It explicitly outlines where and what new



*IV. Mathews County Today and Tomorrow:
Conditions, Opportunities, Policies and Strategies*

shoreline best management practices should be considered where coastal modifications are necessary to reduce shoreline erosion and protect our fragile coastal ecosystems. This guidance will include a full spectrum of appropriate management options which can be used by local governments for site-specific application and consideration of cumulative shoreline impacts. The guidance applies a decision-tree method using a based resource mapping database that will be updated from time to time, and a digital geographic information system model created by VIMS.

The Center for Coastal Resources Management (CCRM) has developed a portal for Mathews County and the guidance information, including Comprehensive Plan guidance, is available through a link to the County's website (www.co.mathews.va.us) and is found on the Department of Planning, Zoning and Wetlands page. The link to the portal is <http://ccrm.vims.edu/ccrmp/mathews/index.html>.

Several recommendations for adoption identified in the CCRMP for a Comprehensive Plan are:

- Utilize VIMS' CCRMP Shoreline Best Management Practices for management recommendations for all tidal shorelines in the County.
- Consider a policy where the above Shoreline Best Management Practices become the recommended adaptation strategy for erosion control, and where a departure from these recommendations by an applicant wishing to alter the shoreline must be justified at a hearing of the Mathews County Wetlands Board.
- Encourage staff training on decision making tools developed by CCRM at VIMS.
- Follow the development of the state-wide General Permit being developed by VMRC.
- Seek public outreach opportunities to educate citizens and stakeholders on new shoreline management strategies including living shorelines.
- Consider preserving available open space adjacent to marsh lands to allow for inland retreat of the marshes under rising sea levels.
- Evaluate and consider cost-share opportunities for construction of living shorelines.

Natural Heritage Resources

The Virginia Department of Conservation and Recreation (DCR) identifies and protects natural heritage resources, maintaining a comprehensive database of documented occurrences. The database includes conservation sites that contain known populations of natural heritage resources and adjacent habitat vital for their protection and stewardship.

The DCR database is useful for aiding local and regional planning; screening development projects for potential impacts on natural heritage resources; identifying targets for acquisition and easements and guiding property restoration activities.



IV. Mathews County Today and Tomorrow: Conditions, Opportunities, Policies and Strategies

There are several areas in Mathews County designated for conservation areas including Bethel Beach Natural Area Preserve, New Point Comfort Preserve, and most of the eastern shoreline of the County toward Milford Haven and Piankatank River.

Bethel Beach Conservation Site has a significant biodiversity ranking and features a long sandy beach, low dunes and extensive salt marsh. The Beach is essential habitat for several rare species, including the federally threatened northeastern beach tiger beetle (*Cicindela dorsalis*), which spends its entire two-year life cycle on the beach. Other species of special concern are the least tern (*Sterna antillarum*) and the sea-beach knotweed (*Polygonum glaucum*). Behind Bethel Beach is an extensive saltmarsh. This marsh is one of the few places in Virginia documented as a nesting site for the Northern Harrier (*Circus cyaneus*), a hawk that usually nests in more northern regions.

As development of natural areas and forest lands increases in Mathews County, natural heritage resources may be threatened. Forest fragmentation, introduction of invasive flora and fauna, and alteration of the local hydrology through land disturbance and/or sea level rise may change or eliminate habitat.

Useful DCR References and Resources:

Bethel Beach Natural Area Preserve Fact Sheet. Virginia Department of Conservation and Recreation, Natural Heritage Program.

http://www.dcr.virginia.gov/natural_heritage/documents/pgbethel.pdf

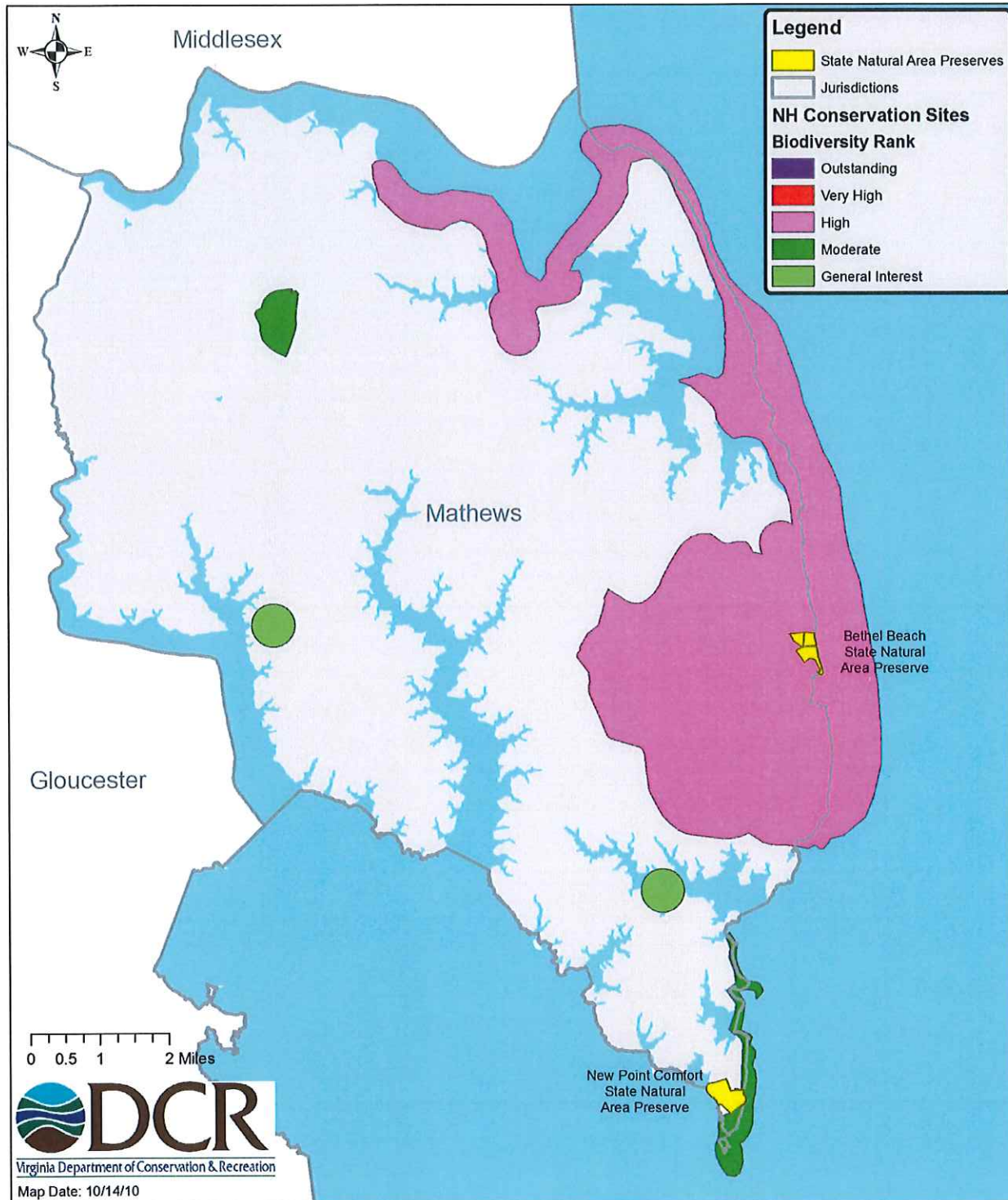
Definitions of Abbreviations used on Natural Heritage Resource Lists

http://www.dcr.virginia.gov/natural_heritage/help.shtml



*IV. Mathews County Today and Tomorrow:
Conditions, Opportunities, Policies and Strategies*

NATURAL HERITAGE CONSERVATION SITES





IV. Mathews County Today and Tomorrow: Conditions, Opportunities, Policies and Strategies

Scenic Rivers

Several waterways contribute to the region's natural beauty and economy by supporting the tourism and maritime industries. Virginia Department of Conservation and Recreation's Virginia Outdoors Plan (VOP) identifies scenic rivers and bodies of water throughout the Commonwealth as part of the Virginia Scenic River Program. Virginia Scenic Rivers Program's intent is to identify, designate and help protect rivers and streams that possess outstanding scenic, recreational, historic and natural characteristics of statewide significance for future generations. VOP states that as of 2013, there are no designated scenic rivers in the Middle Peninsula Planning District though several rivers are being evaluated for consideration. The Piankatank River is considered "qualifying" as a scenic river from Route 17 in Middlesex, Gloucester and Mathews Counties to the Chesapeake Bay. The Virginia Outdoors Plan also recommends several rivers in Mathews County as scenic resources, including the Piankatank River, Mobjack Bay, Chesapeake Bay and New Point Comfort.

Important Bird Areas

The Virginia Audubon Society has identified Important Bird Areas in Mathews County. Conservation lands in the county include Bethel Beach and New Point Comfort Natural Area Preserves. Extensive low marsh areas within these lands support significant populations of Clapper Rail, Seaside Sparrows, and Marsh Wrens, while tide pools support a large diversity of breeding species as well as migrant shorebirds. Large high marsh areas provide habitat for breeding populations of Sedge Wrens, Northern Harriers, Prairie Warblers, and Eastern Meadowlarks. Least Terns and American Oystercatchers are found on sandy berms and barriers while scattered pine hummocks and adjacent maritime forests support significant populations of Brown-headed Nuthatches and Chuck-will's-widows. Isolated marsh islands support breeding American Black Ducks and American Oystercatchers. A map showing the Mathews Loop of the Virginia Birding and Wildlife Trail is on the Recreation Facilities Map.

Threatened and Endangered Species

The Virginia Department of Conservation and Recreation Virginia Outdoors Plan (2013) indicates that there is one Federal Threatened Species, the Northeastern Beach Tiger Beetle, in Mathews County.

A status review by the U.S. Fish & Wildlife Service (USFWS) in February 2009 recommended that the Tiger Beetle be reclassified from threatened to endangered. Since the last comprehensive survey conducted by the USFWS in 2008, total beetle numbers have declined 70% throughout their range along the western shoreline of the Chesapeake Bay in Virginia.

In addition to the Tiger Beetle there are various State species that are considered threatened, endangered or of special concern. These species are listed in the table on the following page and include amphibians, birds, beetles and plants.



**IV. Mathews County Today and Tomorrow:
Conditions, Opportunities, Policies and Strategies**

Threatened and Endangered Species of Mathews County							
Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	Last Year Observed	Site Name
Amphibians							
<i>Ambystoma mabeei</i>	Mabee's Salamander	G4	S1S2		LT	2000	Blakes Ponds
<i>Ambystoma tigrinum</i>	Tiger Salamander	G5	S1		LE	1988	
<i>Hyla gratiosa</i>	Barking Treefrog	G5	S1		LT	1984	
Birds							
<i>Ammodramus caudacutus</i>	Saltmarsh Sharp-tailed Sparrow	G4	S2B,S3N		SC	1985	
<i>Asio flammeus</i>	Short-eared Owl	G5	S1B,S3N			1988	
<i>Cistithorus platensis</i>	Sedge Wren	G5	S1B,S1S2N		SC	1992	New Pt Comfort
<i>Circus cyaneus</i>	Northern Harrier	G5	S1S2B,S3N		SC	1994	Bethel Beach
<i>Sterna antillarum</i>	Least Tern	G4	S2B		SC	2007	Bethel Beach
Communities							
	Coastal Plain Depression Wetland	G3	SNR			1988	Blakes Ponds
Invertebrates							
<i>Cicindela dorsalis</i>	Northeastern Beach Tiger Beetle	G3G4T2	S2	LT	LT		New Point Comfort, Bethel Beach
Vascular Plants							
<i>Chelone obliqua</i>	Red Turtlehead	G4	S1			1979	
<i>Mitreola petiolata</i>	Lax Hornpod	G5	S1			1979	
<i>Polygonum glaucum</i>	Sea-beach Knotweed	G3	S2			2007	Bethel Beach
Natural Area Preserves							
Bethel Beach							
New Point Comfort							
State Ranking: S1-Extremely rare; S2-Very rare; S3-Rare to uncommon; S#B-Breeding; S#N-Non-breeding Global Ranking: G1-Extremely rare; G2-Very rare; G3-Rare to uncommon; G4-Common; G5-Very common Federal Status: LE= Listed Endangered; LT= Listed Threatened State Status: LE= Listed Endangered; LT=Listed Threatened; SC= Special Concern							

Source: Virginia Department of Conservation and Recreation, 2010.



IV. Mathews County Today and Tomorrow: Conditions, Opportunities, Policies and Strategies

Virginia Coastal Zone Management Program

Mathews County is included in the Virginia Coastal Zone Management Program (CZM). This program was established in 1986 (and reauthorized in 2006) to protect and manage Virginia's coastal areas. It is part of a national coastal zone management program coordinated by the National Oceanic and Atmospheric Administration (NOAA) which provides funding for programs. The goals of the program are to protect and restore coastal resources, habitats, and species; restore and maintain the water quality of coastal waters; protect air quality; reduce and prevent losses of coastal habitat, life and property; provide for viable fisheries and aquaculture; promote ecotourism and increase public access to coastal waters; promote renewable energy production; ensure appropriate development on coastal lands; minimize coastal resource land use conflicts; and promote education. In Virginia, it is administered through a network of participating state agencies including: Virginia Department of Environmental Quality (lead agency), Virginia Department of Conservation and Recreation, Virginia Department of Game and Inland Fisheries, Virginia Marine Resources Commission, Virginia Department of Health, and the Chesapeake Bay Local Assistance Department; assisting agencies include the Virginia Departments of Historic Resources, Forestry, Agriculture and Consumer Services, and Transportation, Virginia Institute of Marine Science, Virginia Economic Development Partnership, and the Coastal Planning District Commissions.

Over the past several years, the CZM program has played a significant role in Mathews County's efforts to address environmental needs and issues by providing funding for various projects. MPPDC acquired funding through the CZM program to administer various shoreline erosion projects in the Middle Peninsula region. More specifically, the CZM program has made it possible for MPPDC and Mathews County to explore and formulate possible solutions to issues such as ditch maintenance, sea level rise and development impacts associated with recurrent flooding.

Chesapeake Bay Act

In 1988, the State of Virginia adopted the *Chesapeake Bay Act* which established the foundation for public policy and planning for the Chesapeake Bay, the largest estuary in the United States, and adjacent lands. In 2000, Virginia signed *Chesapeake 2000*, a partnership agreement with

Localities subject to the Chesapeake Bay Preservation Act



Source: VA Dept. Conservation and Recreation



IV. Mathews County Today and Tomorrow: Conditions, Opportunities, Policies and Strategies

Maryland, Pennsylvania, the District of Columbia, and the Environmental Protection Agency, that committed the Commonwealth to a shared vision for a restored ecosystem and goals for the future related to living resources, habitat protection, water quality, land use and stewardship.

Introductory Paragraph - 1988 Virginia Chesapeake Bay Act

"Healthy state and local economies and a healthy Chesapeake Bay are integrally related; balanced economic development and water quality protection are not mutually exclusive. The protection of the public interest in the Chesapeake Bay, its tributaries, and other state waters and the promotion of the general welfare of the people of the Commonwealth require that: (i) the counties, cities, and towns of Tidewater Virginia incorporate general water quality protection measures into their comprehensive plans, zoning ordinances, and subdivision ordinances; (ii) the counties, cities, and towns of Tidewater Virginia establish programs, in accordance with criteria established by the Commonwealth, that define and protect certain lands, hereinafter called Chesapeake Bay Preservation Areas, which if improperly developed may result in substantial damage to the water quality of the Chesapeake Bay and its tributaries; (iii) the Commonwealth make its resources available to local governing bodies by providing financial and technical assistance, policy guidance, and oversight when requested or otherwise required to carry out and enforce the provisions of this chapter; and (iv) all agencies of the Commonwealth exercise their delegated authority in a manner consistent with water quality protection provisions of local comprehensive plans, zoning ordinances, and subdivision ordinances when it has been determined that they comply with the provisions of this chapter."

The Chesapeake Bay Act requires local governments to incorporate water quality protection measures into adopted plans and regulations; to define certain lands important to the water quality of the Chesapeake Bay; and authorized the Chesapeake Bay Local Assistance Board (CBLAB) to administer the program. The promulgated regulations developed by the Board required that local governments develop local programs to comply with the Chesapeake Bay Act and to promote high water quality, prevent pollution, and encourage water resource conservation. Every local program must incorporate the Chesapeake Bay Act provisions into the comprehensive plan, define important areas, and include measures to protect water quality in zoning, subdivision and erosion control ordinances. Planning tools governing development in the permitted land uses and development in sensitive areas should be consistent with the regulations and requirements set forth in the Chesapeake Bay Act.

Chesapeake Bay Preservation Areas are defined in the Act as Resource Protection Areas and Resource Management Areas. These areas have specific elements defined to protect, as well as general performance criteria that must be met for any new or expanded land development.

- **Resource Protection Areas (RPA)** include: tidal wetlands; non-tidal wetlands connected by surface flow and contiguous to tidal wetlands or water bodies with perennial flow; tidal shores; and other lands considered by the local government that have intrinsic water quality value due to ecological and biological processes they perform or that are sensitive to impacts. In addition, there is a required buffer of not less than 100 feet adjacent to these lands.



IV. Mathews County Today and Tomorrow: Conditions, Opportunities, Policies and Strategies

- **Resource Management Areas (RMA)** include: floodplains; highly erodible soils, including steep slopes; highly permeable soils; non-tidal wetlands not included in the RPA; land areas less than five acres surrounded by such land types; and a minimum area 150 feet in width landward of the RPA on lands where none of the RMA listed land types exist; and other lands considered by the local government to be necessary in protecting water quality. The RMA should be large enough to provide significant water quality protection in accordance with adopted land use and development performance criteria to reduce non-point source pollution.

The Virginia Department of Environmental Quality's Chesapeake Bay Local Assistance Program provides local program training, public education, technical assistance, and works with local governments to ensure that their programs follow the adopted regulations. Regional planning district commissions also act as liaisons in aiding local governments. Implementation of the program for localities was scheduled in three phases:

- Phase I – designate and map Chesapeake Bay Preservation Areas, amend local ordinances to incorporate performance criteria, and establish a development review process;
- Phase II – review and revise the local comprehensive plan to include information on certain land use and development factors affecting water quality (e.g., identification of Chesapeake Bay Preservation Areas, physical constraints to development, character and location of commercial and recreational fisheries and other aquatic resources, water supply and protection, shoreline and soil erosion, existing and future land use, public and private waterfront access, and sources of water pollution). In addition, the comprehensive plan is to provide public policy statements relative to protecting water quality and implementation methods.
- Phase III – review and revise local development ordinances (zoning, subdivision, erosion and sediment control, etc.) to include specific notations on plats and development plans, and to incorporate provisions for minimizing land disturbance, preserving indigenous vegetation, and minimizing impervious cover.

Compliance reviews for consistency with Chesapeake Bay Preservation Act regulations should be done every five years, when feasible, in conjunction with the community's update of the comprehensive plan. As of 2008, an Annual Implementation Report is required which describes the community's development activity, history of exceptions, best management practices utilized, septic pump-out data, mapping of the RPA, and any violations.

To date, Mathews County has complied with Phases I and II of the program; County ordinances and designation of areas were found consistent, as was the 2001 Comprehensive Plan. For the benefit of consistency, the *Water Quality Improvement Plan* section of the 2001 Plan is included as an appendix to this document for the purposes of reference and the Chesapeake Bay Local Assistance Board approved compliance to date. The updated Comprehensive Plan 2030 builds



IV. Mathews County Today and Tomorrow: Conditions, Opportunities, Policies and Strategies

upon this previous document, updates information and expands development policies as they apply to protecting water quality and sensitive environmental areas. In addition, future land use categories have been expanded to encourage land conservation and best management practices for development (see Future Land Use Section for details).

In 2016, MPPDC requested and received funding from the Department of Environmental Quality to assist Mathews County with Phase III Performance Standards implementation which coincides with the Comprehensive plan update and subdivision and zoning ordinance review. A part of the review process is to address deficiencies found during the Advisory Review conducted by DEQ. The County has adopted a Chesapeake Bay Preservation Area Overlay District as a part of the zoning ordinance that establishes Chesapeake Bay Preservation Area boundaries and buffers, land use and development performance criteria, water quality and environmental impact assessment requirements, and development plan review process. The ordinance is administered by the Mathews County Zoning Administrator and the Wetlands Zoning Board (tidal wetlands), which is served by staff of the Department of Planning and Zoning.

A Compliance Review & Analysis of the County's land use ordinances and policies was conducted by the Berkley Group as a consultant to the MPPDC. Their scope of work was to assess Mathews County's conformance with the Phase III requirements. The Berkley Group completed their analysis in August, 2016 and provided a report to the County. The findings of the report determined that the County's zoning and subdivision ordinances complied as follows:

- The Zoning Ordinance effectively minimizes land disturbances through provisions for preserving open space, clustering, and clearing and grading requirements.
- The Zoning Ordinance effectively preserves indigenous vegetation through provisions to preserve and maintain vegetation within buffer areas, inclusion of provisions in the landscape plan to protect existing trees and other vegetation during clearing and grading, and requirements for environmental site assessments through a Water Quality Impact Assessment (WQIA).
- The Zoning Ordinance includes several provisions to ensure impervious cover is minimized. Such provisions include minimization of parking space size, alternative surfacing, shared parking, minimum parking lot aisle widths, shared driveways, and single-travel aisles in parking areas.
- County Code effectively protects water quality through the requirement to develop erosion and sediment control and stormwater management plans for land-disturbing activities exceeding 2,500 square feet in area



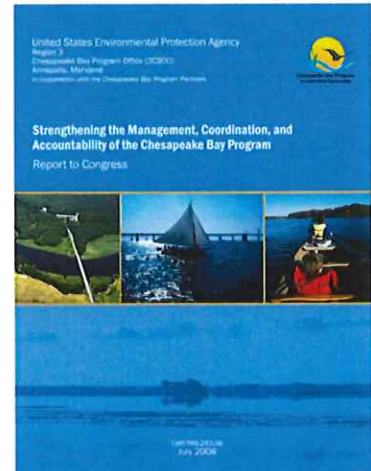
**IV. Mathews County Today and Tomorrow:
Conditions, Opportunities, Policies and Strategies**

- Resource Protection Area land categories are effectively preserved.
- Resource Management Area land categories are compatible with requirements of the CBPA.

In a 2008 report to Congress, EPA advised that “Despite substantial effort and progress by the full spectrum of partners, the Bay’s health remains degraded. Restoration efforts are being overtaken by current trends. For example, population in the watershed has grown nearly 17 million bringing more roads, homes, industrial and business parks, and other impervious surfaces which harden the landscape. Development has drastically altered the natural hydrology and thereby the natural filtering systems for nutrient and sediment pollution.”

~~Another 2008 report, *Chesapeake EcoCheck*¹⁴, advises that the lower Chesapeake Bay region, where Mathews is located, was in moderate to poor ecosystem health (rated as a C-) with water quality in very poor condition and biotic conditions declining from 2007. One positive note, however, was that underwater bay grasses increased in 2008, providing greater assistance in filtering pollutants, producing oxygen, sheltering fish and crabs, and preventing erosion. In addition, there have been modest improvements in blue crab and eastern oyster populations.~~

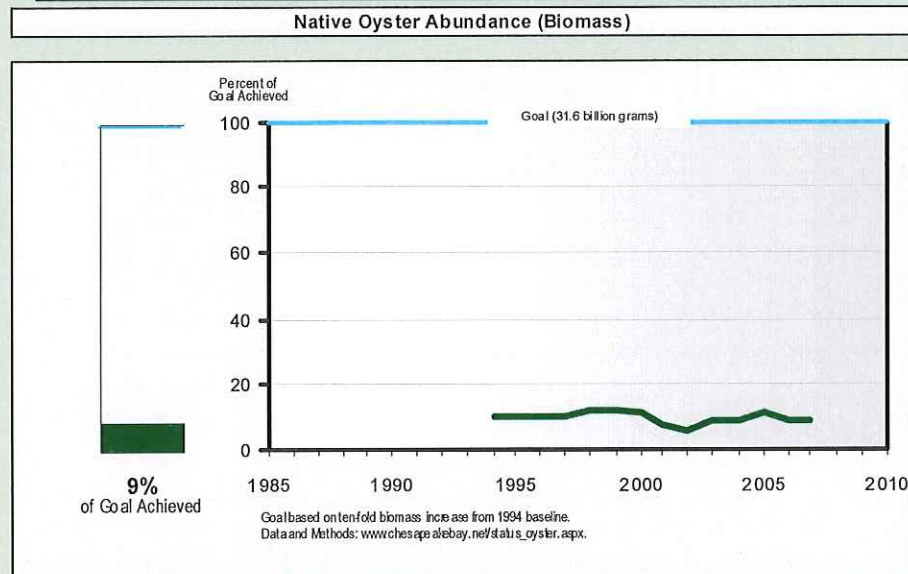
A 2014 report by the Chesapeake Bay Program confirms that the Bay’s condition, while improved, remains poor. Scientists monitoring important habitats, fish and shellfish and water quality measures, report that Bay’s habitat lower food web remains far below what is needed to support thriving populations of underwater life.





IV. Mathews County Today and Tomorrow: Conditions, Opportunities, Policies and Strategies

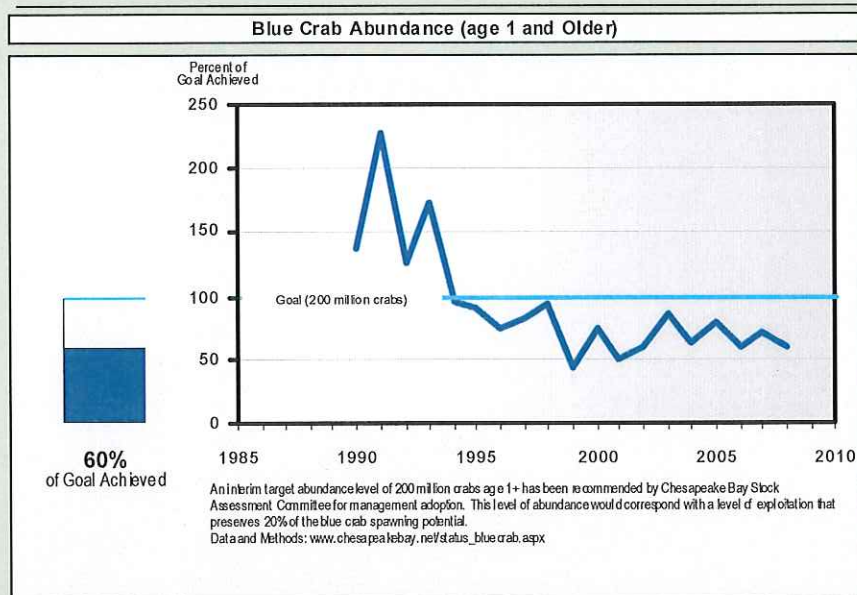
Native Oyster Abundance (Biomass)



Chesapeake Bay Health and Restoration Assessment:
Ecosystem Health March 17, 2009

1

Blue Crab Abundance



Chesapeake Bay Health and Restoration Assessment:
Ecosystem Health March 17, 2009

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Source: Chesapeake Bay Program, www.chesapeakebay.net



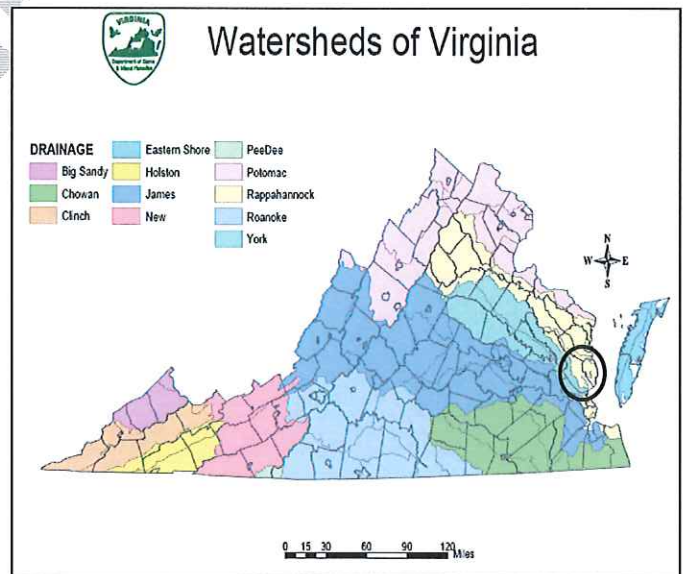
IV. Mathews County Today and Tomorrow: Conditions, Opportunities, Policies and Strategies

During 2009, there has been increased leadership from the Governor of Virginia (as well as from other states) and the President of the United States in addressing pollution issues in the Chesapeake Bay. The Chesapeake Executive Council, comprised of various state and federal representatives, set more aggressive short-term milestones to reduce nitrogen and phosphorus by 2011—Virginia's goal is to reduce phosphorus and nitrogen loads through loan and grant funds for improvements to wastewater systems, land conservation, and BMPs for agriculture, septic systems, stormwater management and erosion and sediment control. At the federal level, an Executive Order for Chesapeake Bay Protection and Restoration (signed May 12, 2009) established a Federal Leadership Committee to oversee coordination of programs and activities involved with Bay restoration; to strengthen accountability of federal agencies; to collaborate with the various state governments; and to publish an annual Chesapeake Bay Action Plan (with recommended funding) and Progress Report for Bay restoration.

The following sections provide more detailed background information and recommendations for the purposes of updating information and meeting the Comprehensive Plan requirements for the Chesapeake Bay Act.

Watersheds and Existing Water Quality

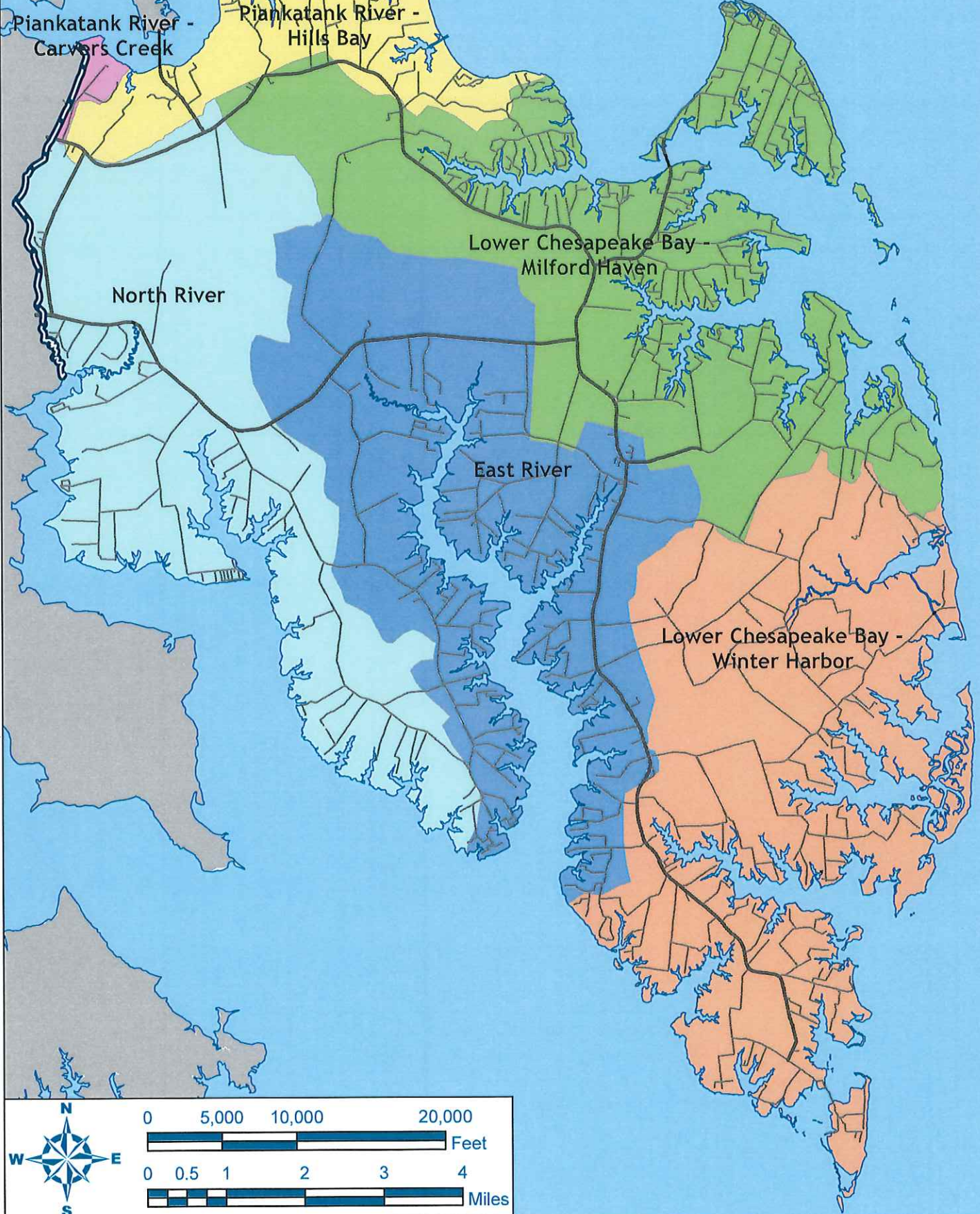
A general map showing the watersheds of Virginia is shown to the right. Mathews County lies between two major watersheds in the State of Virginia – the Rappahannock River and the York River. The County is divided into six smaller watersheds which are considered part of the lower Chesapeake Bay watershed: Piankatank River–Carvers Creek, Piankatank River–Hills Bay, Lower Chesapeake Bay–Milford Haven, Lower Chesapeake Bay–Winter Harbor, East River, and North River. These watersheds are illustrated on the map on the following page.



Source: Virginia Department of Game and Inland Fisheries.



Watersheds





**IV. Mathews County Today and Tomorrow:
Conditions, Opportunities, Policies and Strategies**

In accordance with the Clean Water Act, the Environmental Protection Agency and the Virginia Department of Environmental Quality assess water quality and classify waters using five defined categories. These categories are shown and defined in the table to the right. A Draft 2014 *Water Quality Assessment 305(b) and 303(d) Integrated Report* provides a summary of the water quality conditions in Virginia from January 1, 2007, through December 31, 2012.

A summary of water quality conditions for various waters in Mathews County (2012) is described in the table on the following page. In general, most of the coastal watersheds in the County are impaired waters and classified as Category 4 or 5. Most impairment is due to fecal coliform levels which pose threats to shellfish harvesting. The sources of pollution in the watersheds were listed as either non-point source or unknown.

Water Quality Assessment Categories	Definition
Category 1	Water fully supports all designated uses.
Category 2	Water fully supports all designated uses that data are available for, but there is either insufficient or no information regarding uses that there is no data for.
Category 3	There is insufficient information to determine if any designated uses are being met.
Category 4	Waters are impaired or threatened but do not need a Total Maximum Daily Load (TMDL).
Category 5	Waters are impaired and do need a TMDL.

In June, 2013, the Virginia Department of Conservation and Recreation (DCR) in cooperation with stakeholders of Mathews, Middlesex and Gloucester Counties, developed a Total Maximum Daily Load (TMDL) Implementation Plan to address impairments to waterways and impacts on shellfish due to elevated levels of coliform bacteria and to develop actions to reduce bacteria sources. In Mathews, the waters that were identified as having unacceptable levels of coliform bacteria are the Gwynn's Island and Milford Haven watersheds which include:

- Edwards Creek
- Queens Creek
- Stutts Creek
- Morris Creek
- Billups Creek
- Lanes Creek
- Hudgins Creek
- Barn Creek

And, the Lower Piankatank River watershed which includes Cobbs Creek.



*IV. Mathews County Today and Tomorrow:
Conditions, Opportunities, Policies and Strategies*

Recommendations

Based upon stakeholder input from public meetings, the TMDL Implementation Plan recommends various actions to address impairments to shellfish waters:

- Develop and implement residential education programs focused on septic system maintenance, pet waste management and nuisance wildlife management
- Exclude livestock from waterways
- Establish and maintain vegetated buffers and wetlands
- Promote oyster aquaculture as a method to improve water quality
- Maintain roadside and outfall ditches to reduce the potential for coliform bacteria contamination of waterways.

A map of closed and condemned shellfish waters as of July 2010 follows the table. Because these conditions change, the most up-to-date information should be obtained from Division of Shellfish Sanitation, Virginia Department of Health, Richmond, VA 23219, www.vdh.virginia.gov/shellfish.



**IV. Mathews County Today and Tomorrow:
Conditions, Opportunities, Policies and Strategies**

Watershed	Supports Uses Cat. 1 & 2	Insufficient Information Cat. 3	Impaired Cat. 4 & 5	Impairment Notes (2009) (For specific information and location, see report)
Barn Creek			X	Shellfishing - Fecal Coliform
Billups Creek			X	Shellfishing - Fecal Coliform
Blackwater Creek /Greenmansion Cove			X	Shellfishing - Fecal Coliform
Burke Mill Stream			X	Recreation - E coli Aquatic Life - Dissolved Oxygen
Chesapeake Bay & Tidal Tributary Segments (various)			X	Aquatic Life - Dissolved Oxygen Aquatic Life - Macrophytes Fish Consumption - PCB Fish Tissue
Cobbs Creek			X	Shellfishing - Fecal Coliform
Davis Creek			X	Shellfishing - Fecal Coliform
Doctors Creek			X	Shellfishing - Fecal Coliform
Dyer Creek			X	Shellfishing - Fecal Coliform
East River			X	Shellfishing, Fecal Coliform
Edwards Creek			X	Shellfishing - Fecal Coliform
Horn Harbor			X	Shellfishing - Fecal Coliform
Hudgins Creek			X	Shellfishing - Fecal Coliform
Lanes Creek			X	Shellfishing - Fecal Coliform
Miles Creek			X	Shellfishing - Fecal Coliform
Milford Haven			X	Shellfishing - Fecal Coliform Recreation - Enterococcus
Mobjack Bay			X	Aquatic Life - Macrophytes Aquatic Life - Dissolved Oxygen
Morris Creek			X	Shellfishing - Fecal Coliform
North River			X	Shellfishing - Fecal Coliform
Oakland Creek			X	Shellfishing - Fecal Coliform
Pepper Creek			X	Shellfishing - Fecal Coliform
Piankatank River			X	Aquatic Life - Bioassessment Shellfishing - Fecal Coliform
Put In Creek			X	Shellfishing - Fecal Coliform
Queens Creek			X	Shellfishing - Fecal Coliform
Raines Creek			X	Shellfishing - Fecal Coliform
Sloop Creek			X	Shellfishing - Fecal Coliform
Stutts Creek/Morris Creek			X	Shellfishing - Fecal Coliform
Tabbs Creek			X	Shellfishing - Fecal Coliform
Thomas Creek			X	Shellfishing - Fecal Coliform
Weston Creek			X	Shellfishing - Fecal Coliform
Whites Creek			X	Shellfishing - Fecal Coliform
Winder Creek			X	Shellfishing - Fecal Coliform
Winter Harbor			X	Shellfishing - Fecal Coliform

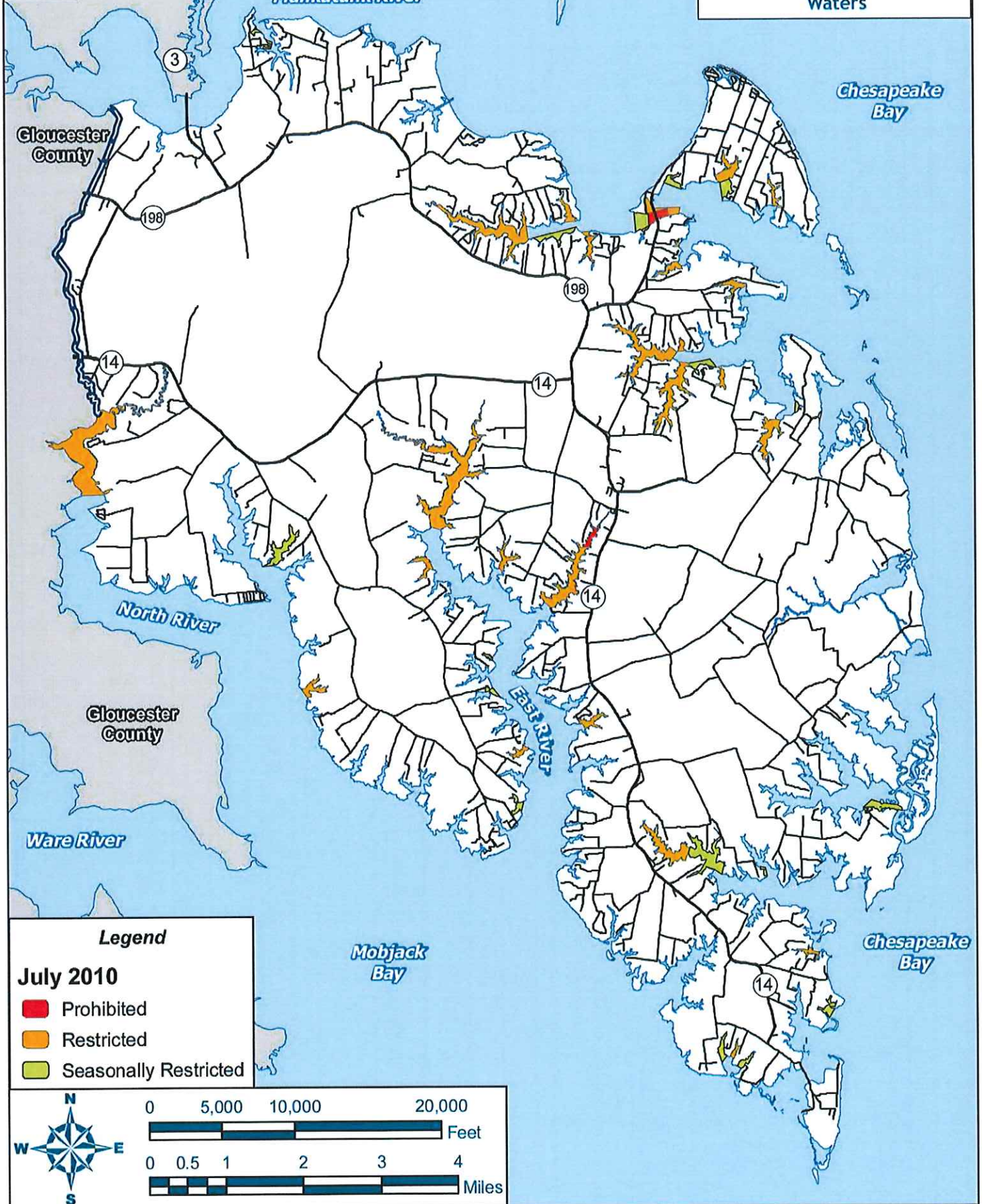


Middlesex County

Mathews County
Comprehensive Plan
2030



Impaired Shellfish
Waters





**IV. Mathews County Today and Tomorrow:
Conditions, Opportunities, Policies and Strategies**

Aquatic Resources, Commercial and Recreational Fisheries

Mathews County is known for its diversity of aquatic resources – natural shorelines, expansive wetlands, and productive environmental habitats. In 2004, VIMS prepared a “Blue Infrastructure” inventory of Virginia’s Coastal Zone¹⁵ that identifies important economic and ecologic aquatic species and resources. These resources included: aquaculture sites, Baylor grounds, anadromous fish streams, oyster reefs, submerged aquatic vegetation (SAV), natural preserves, tidal mudflats and threatened/endangered waters, among others. A map of the blue infrastructure for Mathews County is on the following page. More detailed mapping is available from VIMS at <http://ccrm.vims.edu>. A more current copy of the inventory report is unavailable.

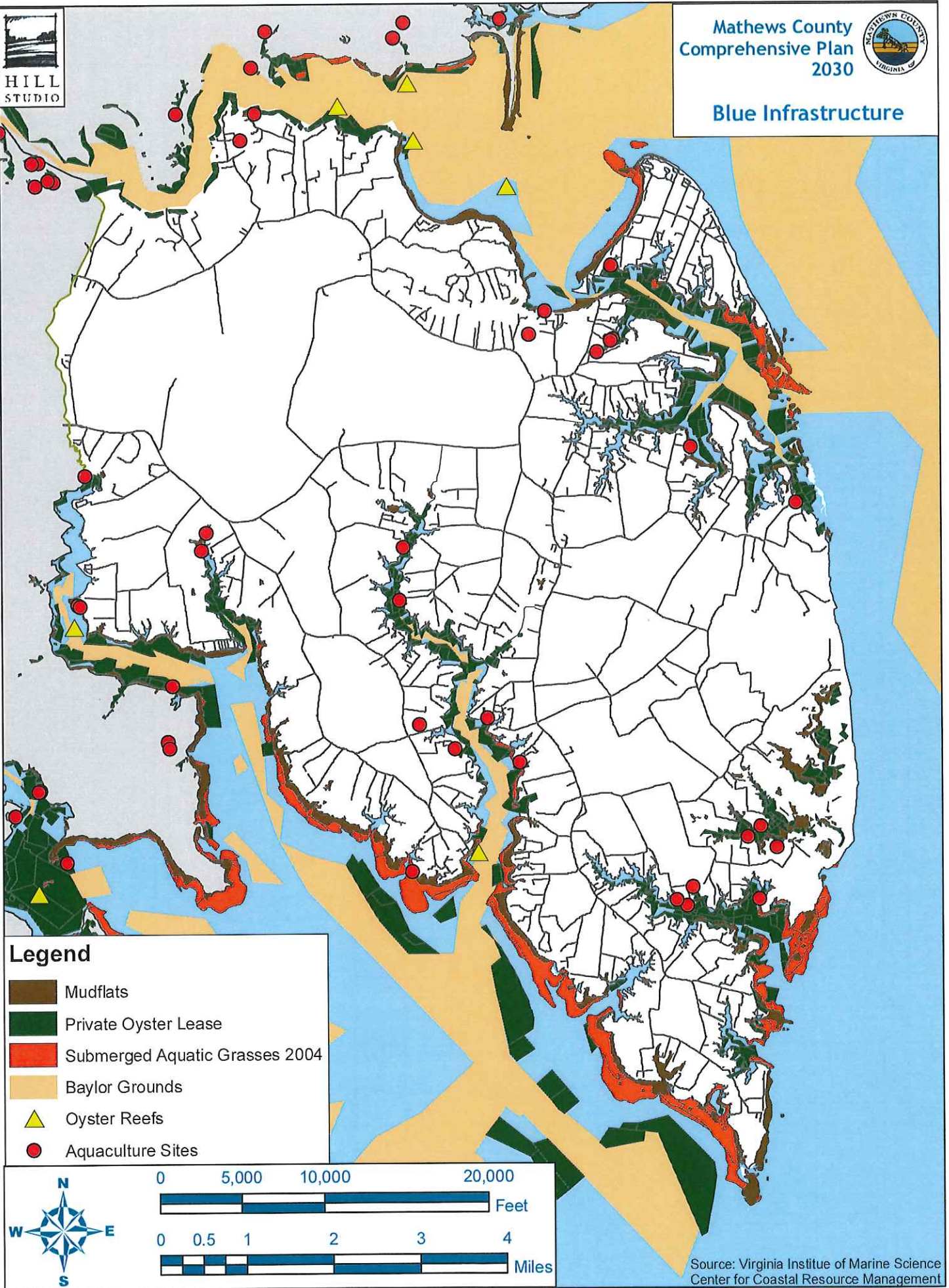
The County continues to work with regional agencies to promote and protect the area’s aquatic resources and commercial fisheries. The 2009 Mathews Aquaculture and Working Waterfront Project with the Middle Peninsula Planning District Commission identified important aquaculture assets and working waterfront sites in the County. The project included coordination with private interests and governmental leaders on future land use and development options to protect and preserve those resources.

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¹⁵ Virginia Institute of Marine Science - Berman, Hershner, and Schatt, Center for Coastal Resources Management. October 2004. *Blue Infrastructure Final Project Report and Deliverables. Blue Infrastructure Criteria and Map.*



Blue Infrastructure



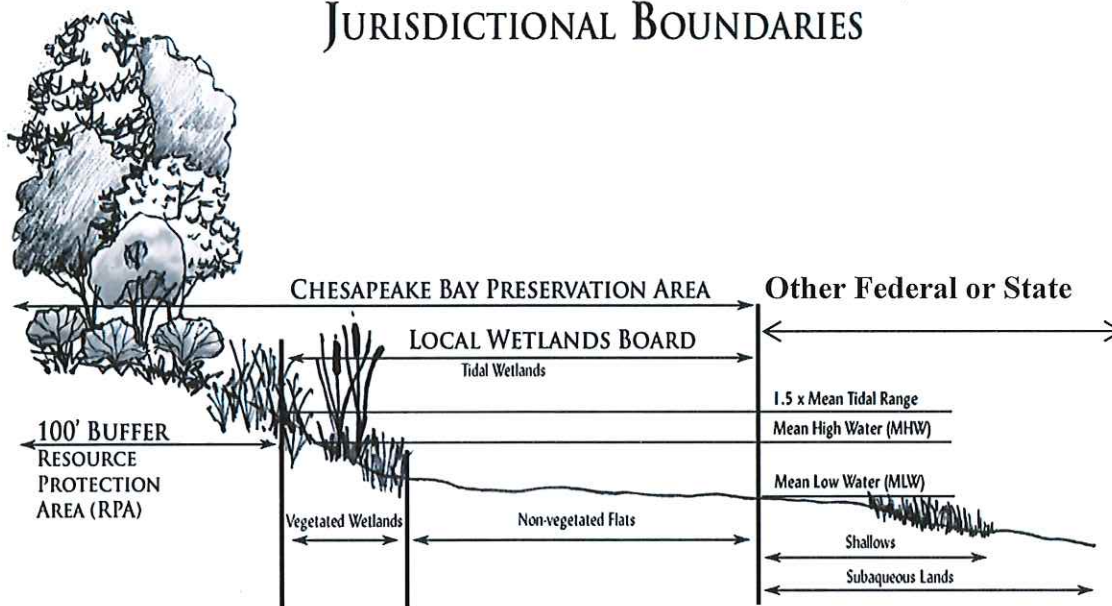


IV. Mathews County Today and Tomorrow: Conditions, Opportunities, Policies and Strategies

Chesapeake Bay Preservation Areas

A map showing the Chesapeake Bay Resource Protection Area (RPA) and Resource Management Areas (RMA) in Mathews County, as defined by the Chesapeake Bay Act, is depicted on the following page. These areas are regulated by the Mathews County Zoning Ordinance as set forth in the Chesapeake Bay Preservation Area Overlay District. The district regulations include required performance criteria for development or redevelopment of land within these areas (e.g., minimal land disturbance, preservation of indigenous vegetation, best management practices, minimal impervious cover, control of stormwater runoff, etc.) and establish procedures for developing property. Development activities in a tidal wetland, such as a dock, shore stabilization, removal of vegetation, etc., must be approved by the County Wetlands Board. In addition, other federal and state agencies (e.g., Army Corps of Engineers, Virginia Marine Resources Commission, etc.) may be involved in development approvals. The graphic below provides a summary of the varied interests involved in reviewing activities in tidal areas.

JURISDICTIONAL BOUNDARIES



Source: VA Department of Conservation and Recreation, Division of Chesapeake Bay Local Assistance

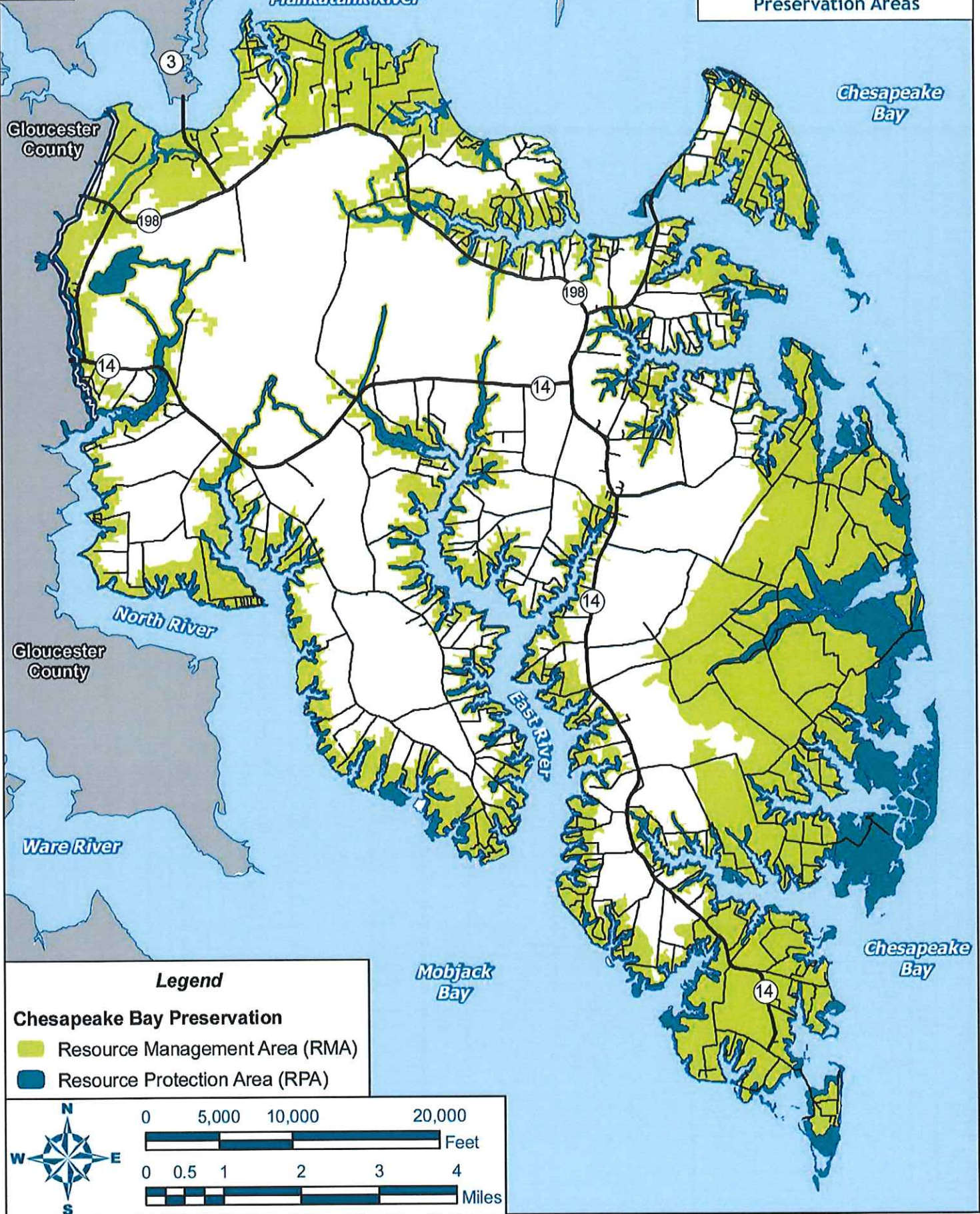


Middlesex County

Mathews County
Comprehensive Plan
2030



Chesapeake Bay
Preservation Areas





IV. Mathews County Today and Tomorrow: Conditions, Opportunities, Policies and Strategies

Physical Constraints to Development

Housing, Population and Demographics information provided in previous sections show a consistent pattern of decline in population growth, housing growth and development activity in the Mathews County. Various environmental factors also contribute to the strain on growth and development in the County. One factor to consider is that much of the County's low elevation above sea level and includes many miles of shoreline. Thus, much of the land is subject to flooding and tidal inundation. Also, much of the County contains wetlands that are "transition zones" between land and water which provide important habitat for plants and animals, serve as significant processors for pollutants, and assist in stabilizing soils and protecting the land. These features are environmental attributes, but they are also considered natural physical constraints to development. The maps on the following pages illustrate the land elevation, 100-year floodplain, and wetlands (tidal and non-tidal) of the County.

When these constraints are considered, there is little land available for new development that does not encounter challenges. As shown in the Composite Constraints map, most of the areas that can appropriately accommodate development are in the northern part of the County.

Recurrent flooding and inundation of land has been an issue within Mathews County. In depth discussions on the causes and possible solutions continues to be an ongoing occurrence within the Mathews Community. The County has utilized professional resources inside and outside the region to help circumstances surrounding recurrent flooding and to explore options for mitigating the impacts.

The Middle Peninsula Planning District Commission and the Mathews County Planning Commission have partnered to acquire funding and explore options to address the impacts and local options to address recurrent flooding due to relative sea level rise. A current effort being funded through Virginia's Coastal Zone Management, looks at planning, financial and regulatory options available to rural coastal local governments in the Middle Peninsula to assist with mitigating the impacts of flooding and sea level rise in coastal communities. The project seeks to identify and explore planning and development techniques that may be implemented at the local level to encourage and steer development to properties located outside of high risk flood hazard areas. The final report will include recommendations to the Planning Commission on various measures that are specific to addressing the issues and concerns of Mathews County.

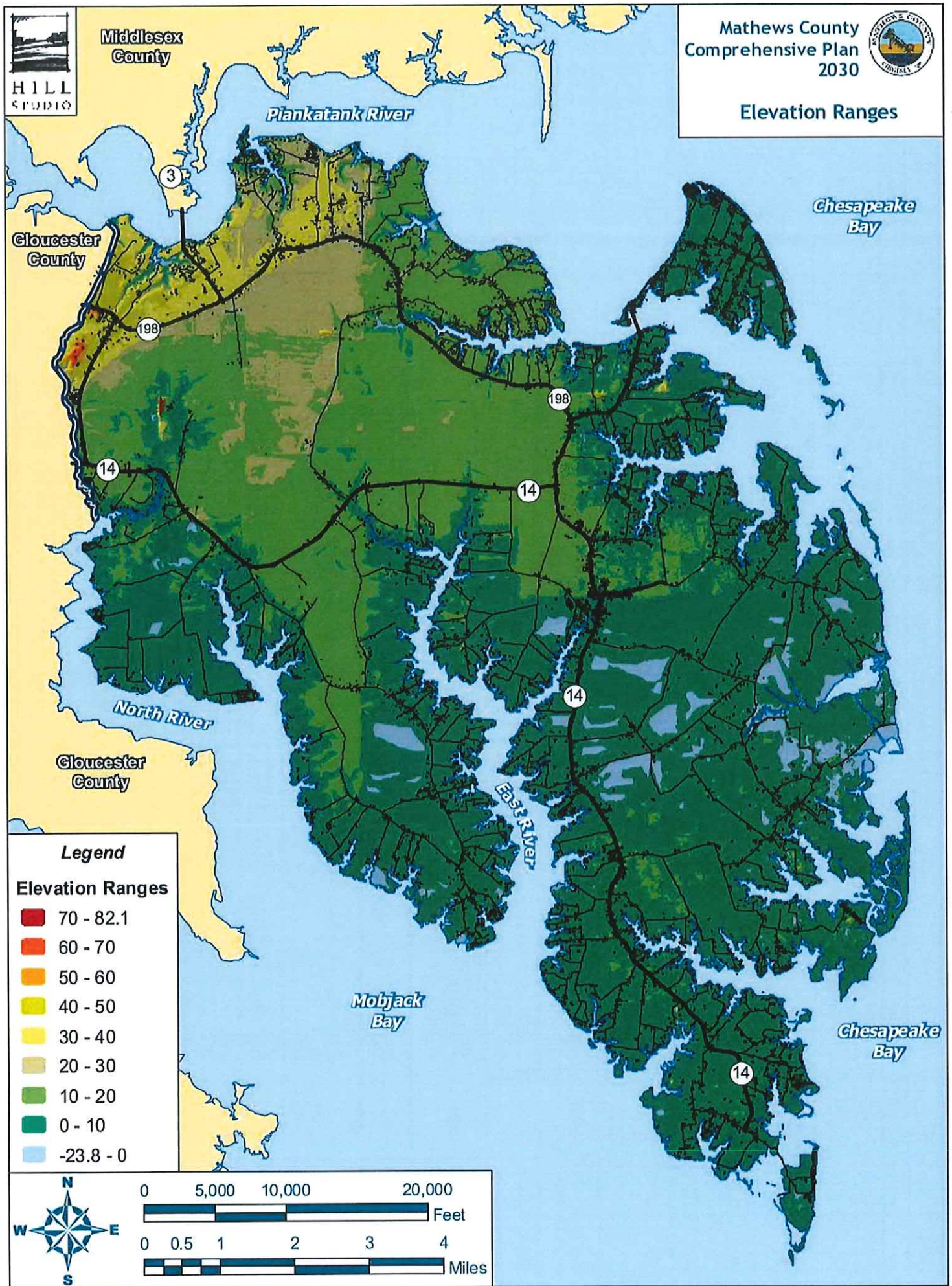


Middlesex
County

Mathews County
Comprehensive Plan
2030



Elevation Ranges



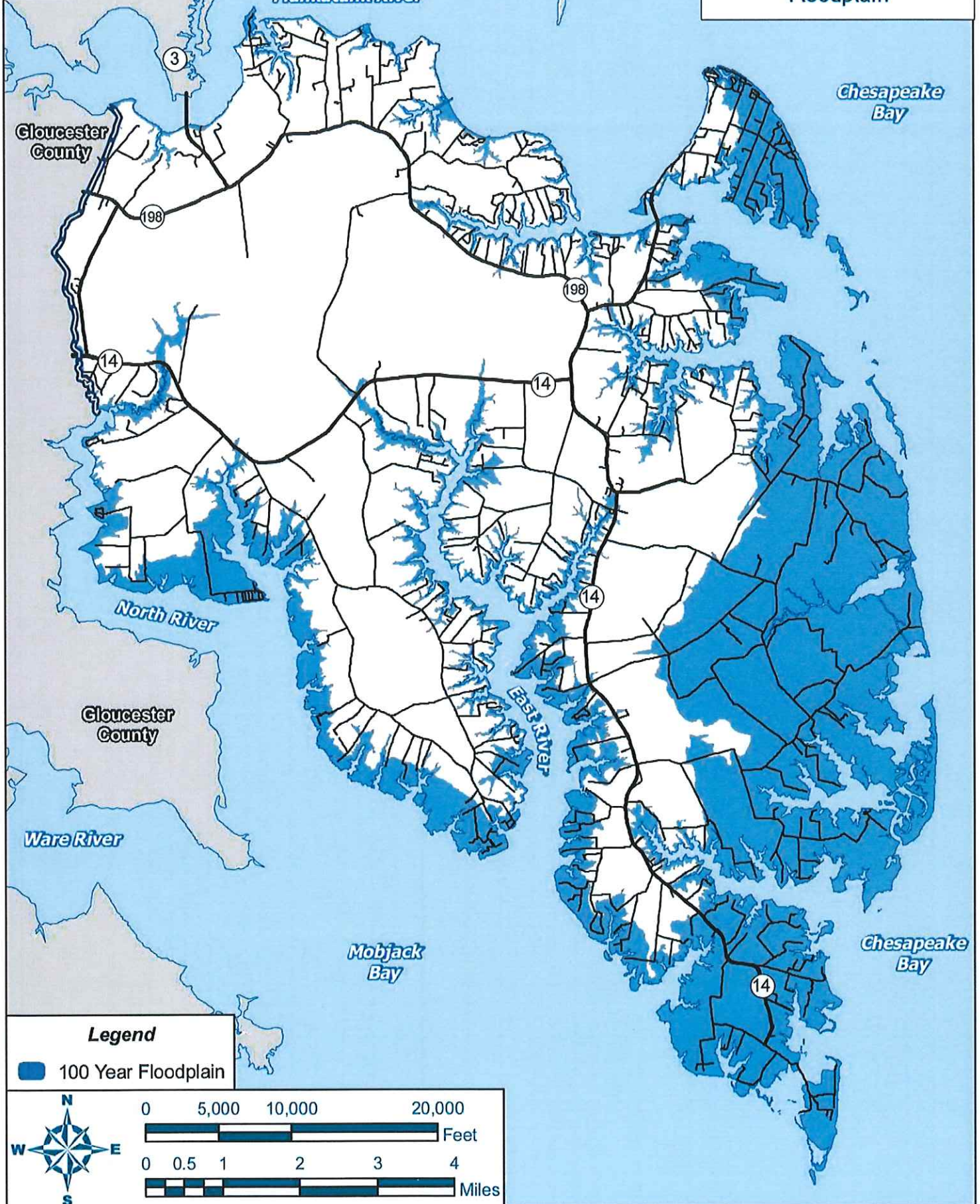


Middlesex
County

Mathews County
Comprehensive Plan
2030



Floodplain



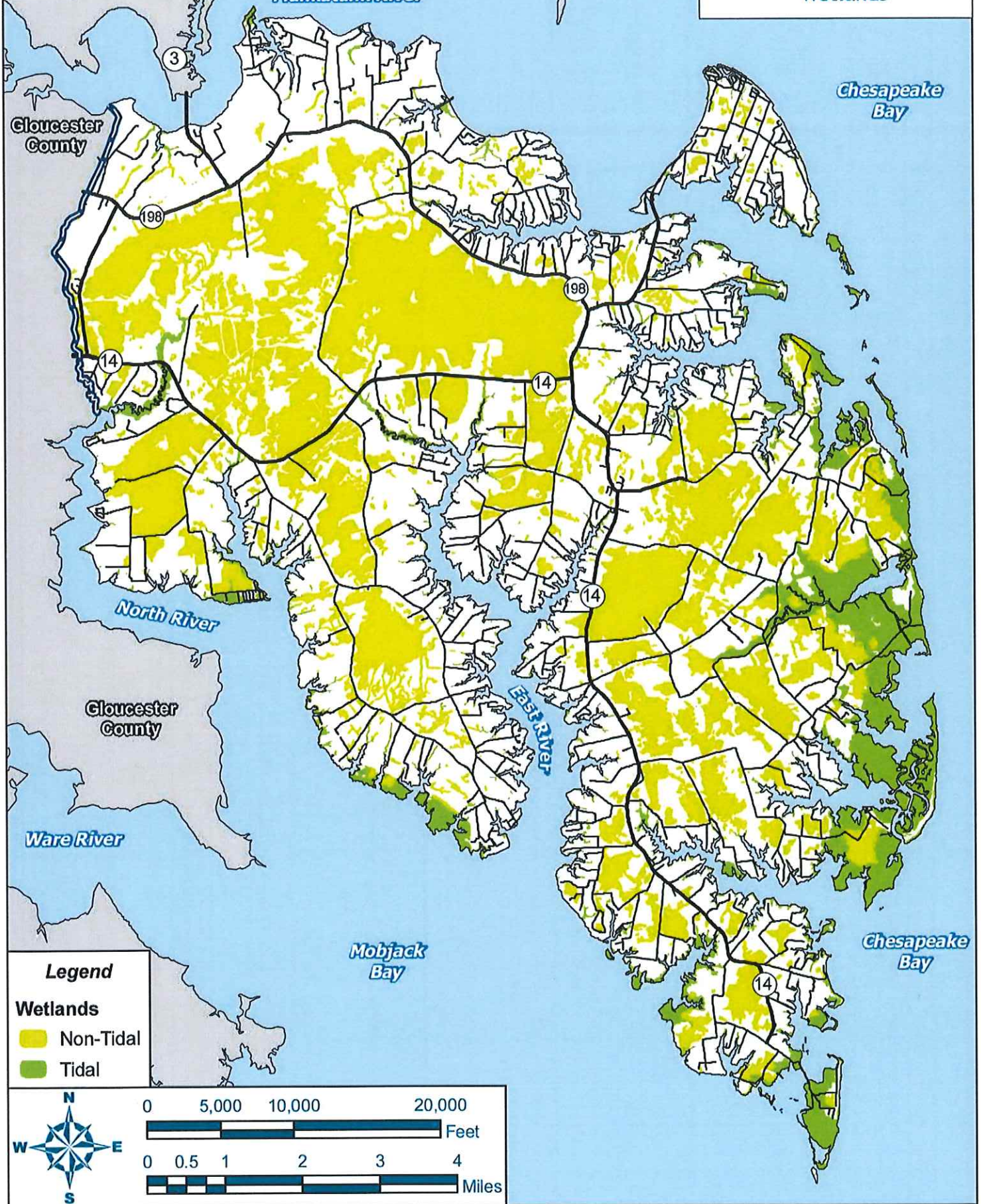


Middlesex
County

Mathews County
Comprehensive Plan
2030

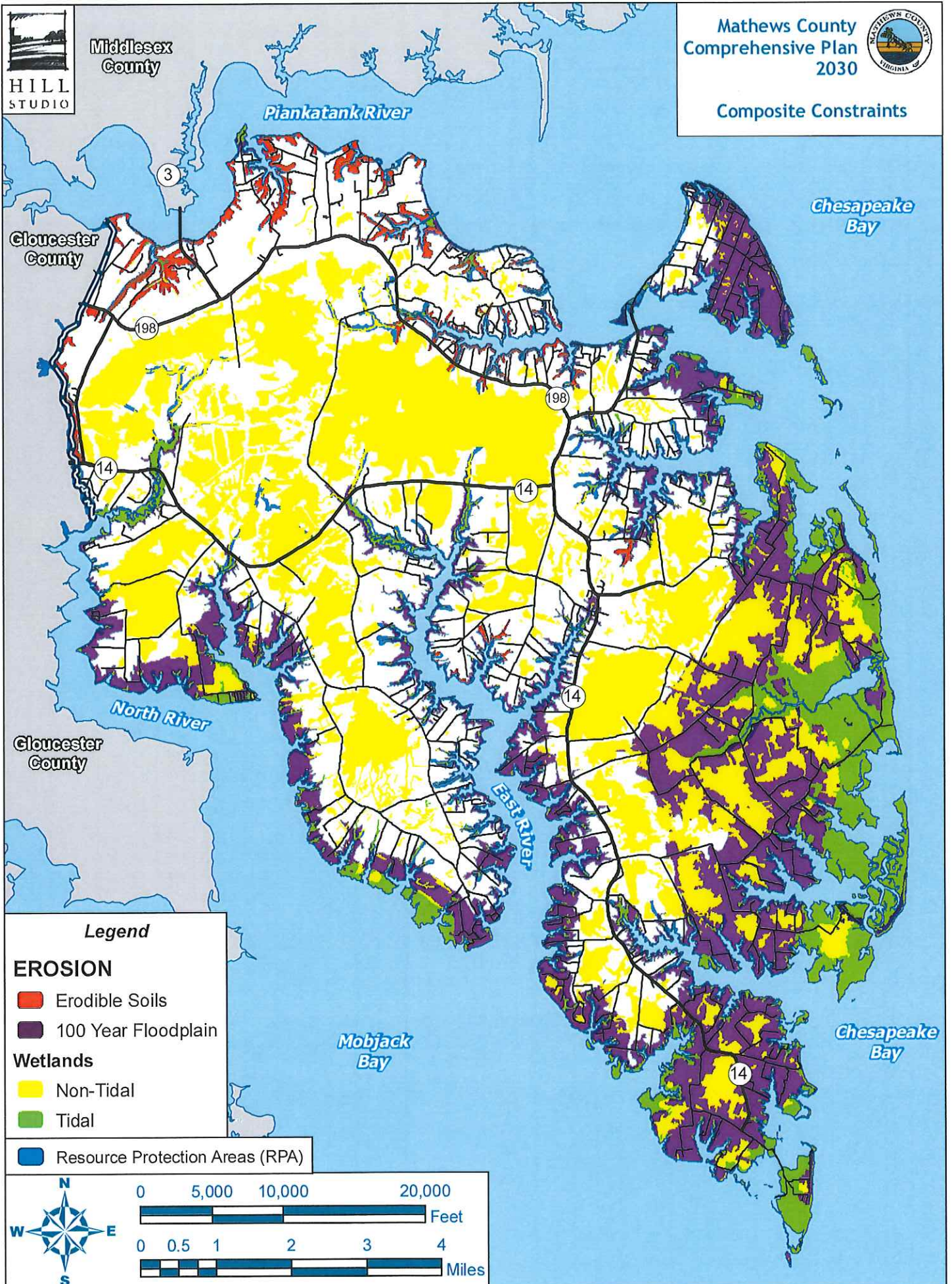


Wetlands





Composite Constraints



Legend

EROSION

- Erodible Soils
- 100 Year Floodplain

Wetlands

- Non-Tidal
- Tidal

- Resource Protection Areas (RPA)



0 5,000 10,000 20,000
Feet

0 0.5 1 2 3 4
Miles



**IV. Mathews County Today and Tomorrow:
Conditions, Opportunities, Policies and Strategies**

Soils and Protection of Shorelines and Streambanks

The soils of Mathews County are shown on the map on the following page. Much of the soil in the County is of the Fallsington fine sandy loam series. The next most common soil type is the Dragston fine sandy loam which is found along most of the County shorelines. The following table summarizes the soil units in the County and provides insight into their acreages. A more detailed description of each of the soil categories is included in the Appendix.

Mathews County, Virginia (VA115)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Be	Bertie very fine sandy loam	78.4	0.1%
Cb	Coastal beach	249.5	0.3%
Dr	Dragston fine sandy loam, shallow	5,554.8	6.1%
Ek	Elkton silt loam	127.2	0.1%
Fa	Fallsington fine sandy loam	33,006.6	36.0%
GP	Gravel Pit	82.1	0.1%
KeA	Kempsville fine sandy loam, 0 to 2 percent slopes	1,414.6	1.5%
KeB	Kempsville fine sandy loam, 2 to 5 percent slopes	300.2	0.3%
KtA	Kempsville loamy fine sand, thick surface, 0 to 2 percent slopes	3,298.8	3.6%
KyA	Keyport silt loam, 0 to 2 percent slopes	109.7	0.1%
KyD2	Keyport silt loam, 8 to 12 percent slopes, eroded	131.3	0.1%
Ma	Mixed alluvial land	164.7	0.2%
SaA	Sassafras fine sandy loam, 0 to 2 percent slopes	251.3	0.3%
SaB2	Sassafras fine sandy loam, 2 to 5 percent slopes, eroded	163.2	0.2%
SdA	Sassafras loamy fine sand, 0 to 2 percent slopes	218.4	0.2%
SsD	Sloping sandy land	428.5	0.5%
StE	Steep sandy land	358.7	0.4%
Th	Tidal marsh, high	640.9	0.7%
To	Tidal marsh, low	2,728.7	3.0%
W	Water	37,402.4	40.8%
Wo	Woodstown fine sandy loam	4,883.4	5.3%
Totals for Area of Interest		91,593.4	100.0%

Source: USDA Natural Resources Conservation Service. April, 2009.

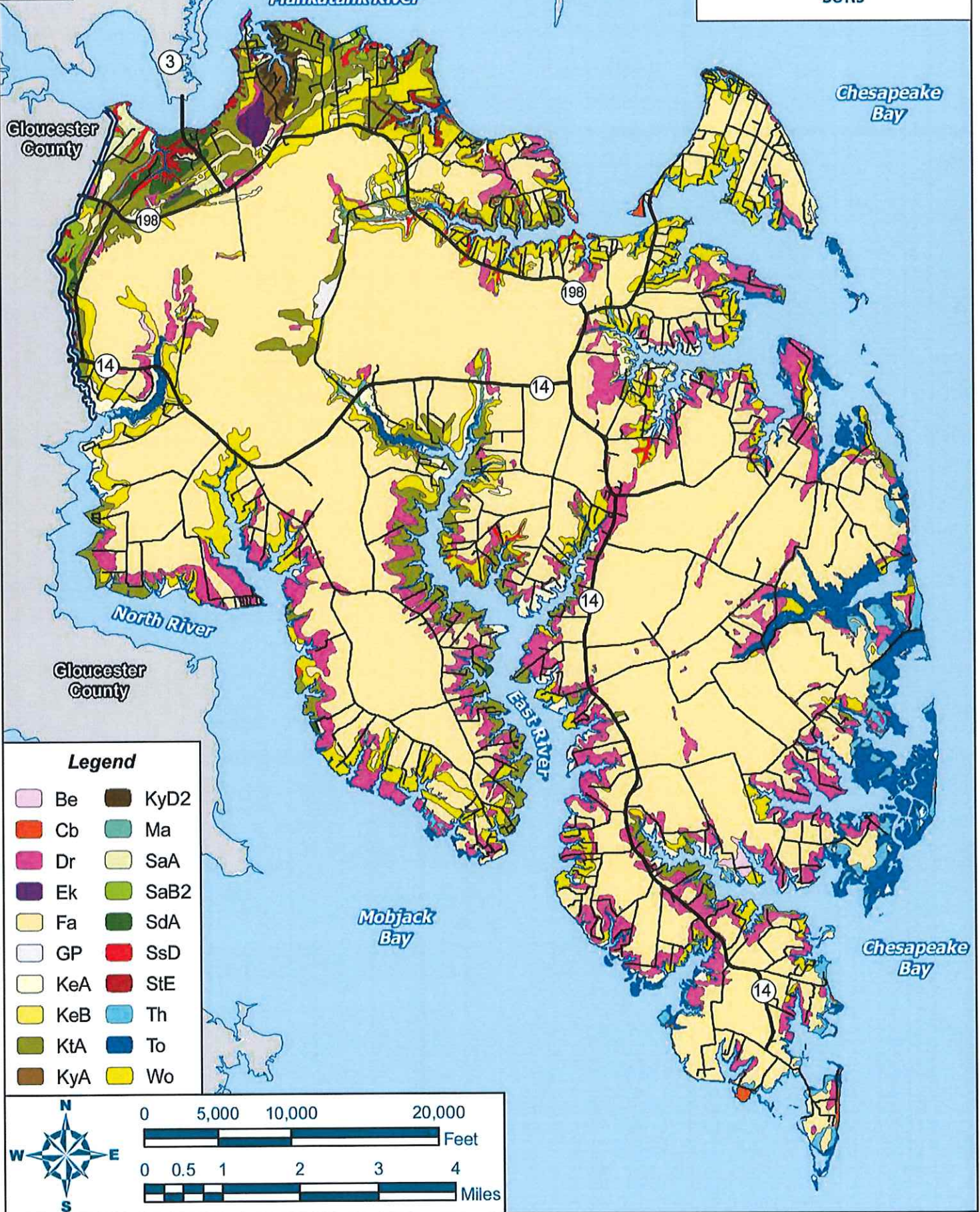


Middlesex County

Mathews County
Comprehensive Plan
2030



Soils





IV. Mathews County Today and Tomorrow: Conditions, Opportunities, Policies and Strategies

The most erodible soils are those of the Keyport silt loam and Sloping and Steep Sandy Loam series. These soils are found along the streambanks of the Piankatank River and Queens Creek in the northern part of the County. A map showing the locations of these erodible soils is on the following page.

In 2008, the Virginia Institute of Marine Science updated the *Shoreline Assessment and Inventory of Mathews County*. A final report **completed in 2010** provides detailed information on the shoreline vegetation, existing stabilization structures, and erosion conditions;¹⁶ It is used as a tool to understand the shoreline conditions of the County, particularly with respect to making better decisions on shoreline management. A map of the shoreline inventory that illustrates shoreline erosion conditions follows the erodible soils map in the preceding pages. This map was prepared based on information provided by VIMS related to the shoreline inventory study. The Shoreline Inventory Report should be referenced for more specific information on a site basis for such elements as riparian land use, streambank conditions and shoreline features, including structures. This informative report and detailed maps are available on line at <http://ccrm.vims.edu>.

A companion initiative beneficial in assisting shoreline management is *Living Shorelines for the Chesapeake Bay Watershed*, prepared by the Center for Coastal Resource Management at VIMS. This collaborative project provides extensive information on natural methods for protecting tidal shorelines using native wetland plants, grasses, shrubs and trees. The benefits of choosing living shoreline techniques include: reduced costs for shoreline stabilization, enhanced water quality, increased wildlife habitat and access, and reduced wave energy. The report is an excellent guide for property owners in understanding and managing their shorelines. The living shoreline report and the shoreline inventory report is useful to property owners, contractors, and the County Wetlands Board in helping to assess the best environmental practices for shoreline stabilization.

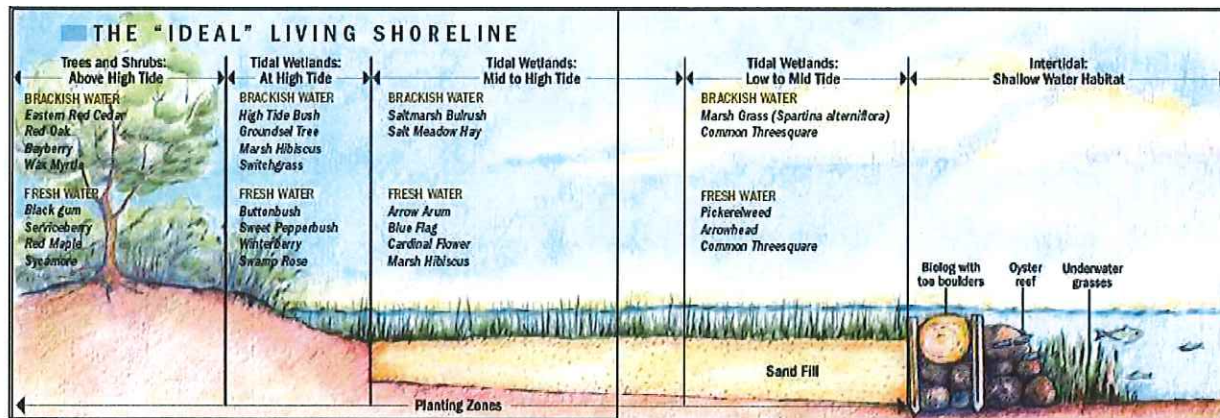
Siting of Docks, Piers, and Structures

In accordance with the Chesapeake Bay Act, the local government must manage the placement of docks, piers and shoreline structures. In Mathews County, this is done through the Wetlands Board and various federal and state permitting agencies. The most comprehensive assessment of shoreline structures for Mathews County is that compiled by VIMS as part of the *Shoreline Assessment and Inventory of Mathews County*. Detailed maps of shoreline structures are available on line at http://ccrm.vims.edu/gis_data_maps/shoreline_inventories/virginia/mathews. Property owners and interested parties should consult this mapping tool and other resources to determine the best management practices and appropriate locations for shoreline structures.

¹⁶ Virginia Institute of Marine Science, Center for Coastal Resources Management. May 2009, Draft. *Mathews County, Virginia Shoreline Inventory Report Methods and Guidelines*.

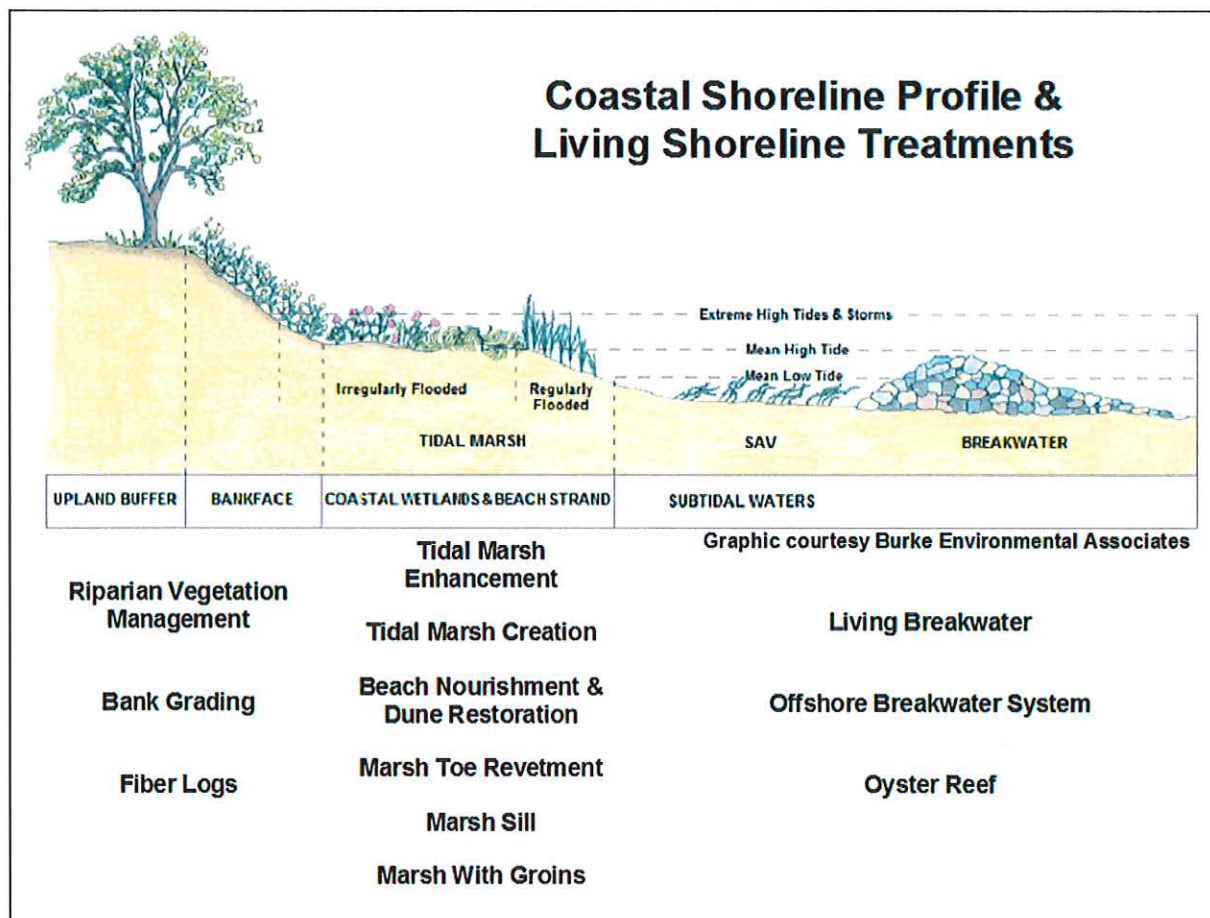


IV. Mathews County Today and Tomorrow: Conditions, Opportunities, Policies and Strategies



Graphics illustrating the living shoreline.

Source: Living Shorelines for the Chesapeake Bay Watershed. VIMS, Center for Coastal Resource



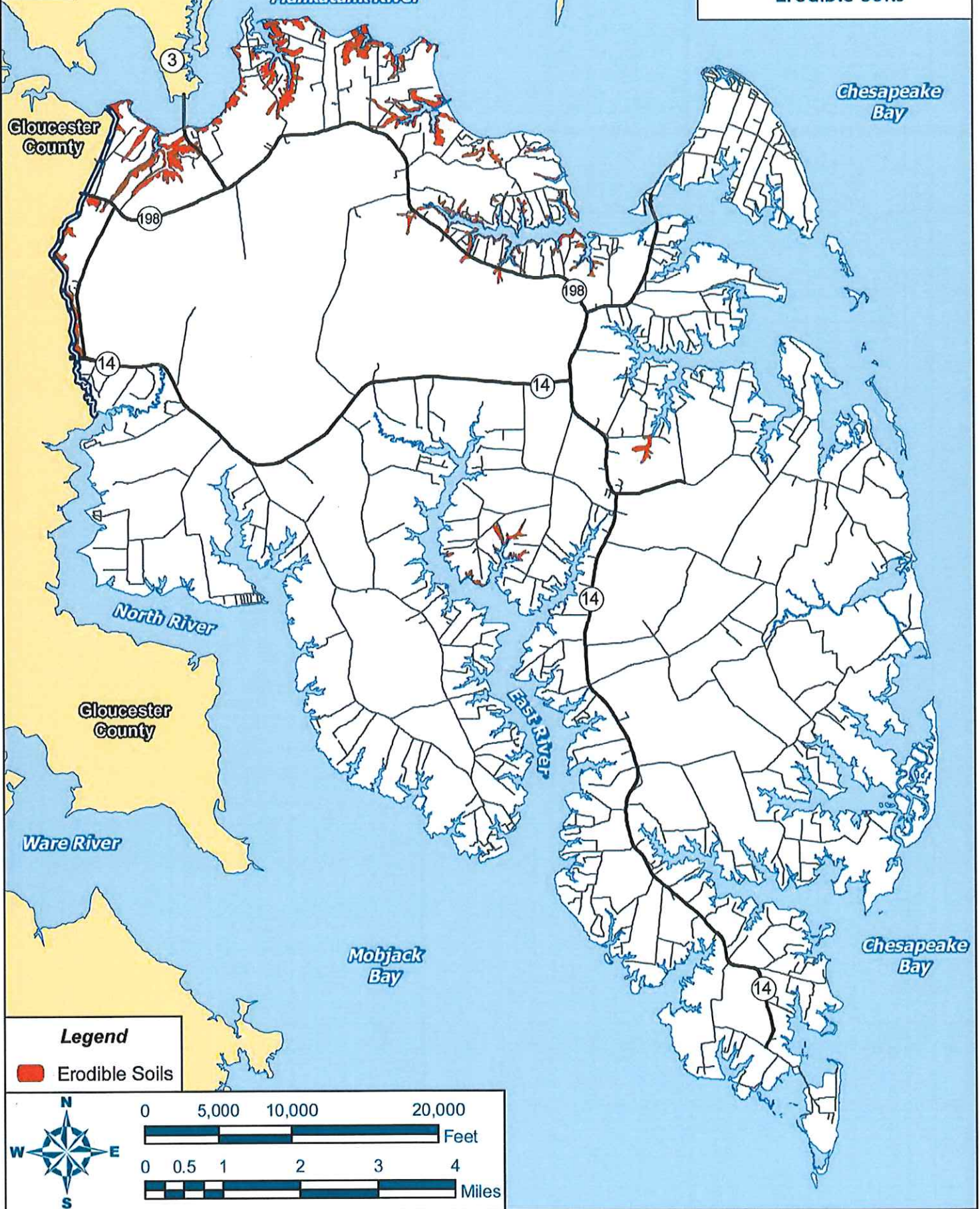


Middlesex
County

Mathews County
Comprehensive Plan
2030



Erodible Soils





Shoreline Inventory



Middlesex
County

Piankatank River

Chesapeake
Bay

Gloucester
County

North River

Gloucester
County

Ware River

Mobjack Bay

Chesapeake
Bay

Legend

Shoreline Stability

-  Erosional
-  Stable
-  Transitional



0 5,000 10,000 20,000
Feet

0 0.5 1 2 3 4
Miles

Source:
Center for Coastal Resource Management,
Virginia Institute of Marine Science



*IV. Mathews County Today and Tomorrow:
Conditions, Opportunities, Policies and Strategies*

Protection of Potable Water Supply

Because the water table in Mathews County is located very near the surface, there is considerable potential for contamination of groundwater and potable water supplies.

One of the principal sources for contamination is from septic systems. Unsaturated soil is essential for treating wastewater. In particular, the permeability of the soil to allow the flow of water through it over a sufficient period of time to filter contaminants is especially important. The permeability of the soils in Mathews County is very limited. A map illustrating the permeability is found on the following page. As indicated, soil permeability is between 0.6 and 6.0 inches per hour for most areas of the county; this absorption capacity is a challenge for septic systems (as shown in the additional map). The northern part of the County and a limited amount of inner shoreline on the East River provide the better opportunities for handling septic systems.

The Middle Peninsula Planning District Commission administers a septic pump out program that provides financial support to low-to-moderate income residents in Middle Peninsula localities. The program, funded through the Virginia Department of Environmental Quality, seeks to promote water quality of the Chesapeake Bay by subsidizing the cost of septic pump out of local residents who may be overly burdened by the cost. The program has received limited funded from DEQ in 2015 and 2016 with no guarantees for future funding.

The MPPDC also administers a septic repair program for Middle Peninsula residents in the way of grants and reduced rate loans. While loan funds are still available, grant funds have been depleted. No new grant funds are immediately available or anticipated.

Since the 2000 Comprehensive Plan, there have been public facility improvements that have reduced the potential for contamination of the potable water supply. The County landfill has been closed and the Virginia Peninsula Public Service Authority continues to monitor the landfill in accordance with the regulations of the Virginia Department of Waste Management. The central wastewater treatment plant in the Mathews Courthouse area has been eliminated and replaced with a sanitary sewer transmission force main.

In 2010, The Hampton Roads Sanitation District began construction on a new sanitary sewer transmission force main from Mathews Court House along Route 198 and Route 3 to Gloucester County. (Additional information on this initiative is found in the Public Facilities and Services (Utilities) section of this plan. While this initiative should help to reduce contamination impacts on potable groundwater, the County will need to provide careful oversight in the future to ensure a safe and ample water supply. This will involve very close coordination with the Virginia Department of Health, and public education on the maintenance of septic and alternative waste systems.



*IV. Mathews County Today and Tomorrow:
Conditions, Opportunities, Policies and Strategies*

Other sources of potential water contamination are underground storage tanks (USTs), agricultural runoff, animal wastes and discharges from boats. While many agricultural operations may utilize best management practices, there is an opportunity to increase public communication with citizens and businesses to promote improved agricultural practices that will enhance water quality. Proper maintenance, installation, or removal of USTs is guided by the Virginia Department of Environmental Quality; information on best management practices can be found at <http://www.deq.state.va.us/tanks/usts.html>.

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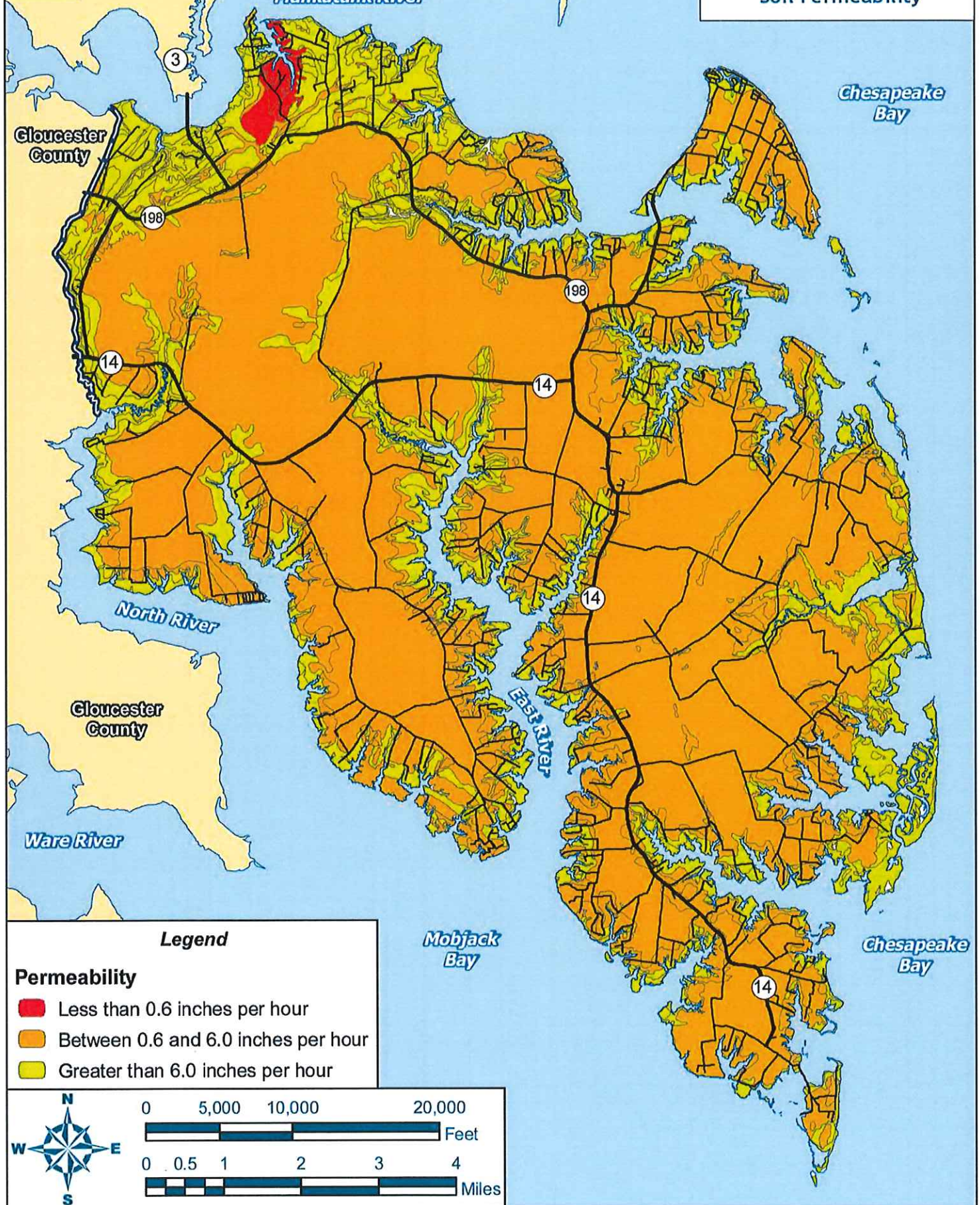


Middlesex County

Mathews County
Comprehensive Plan
2030



Soil Permeability



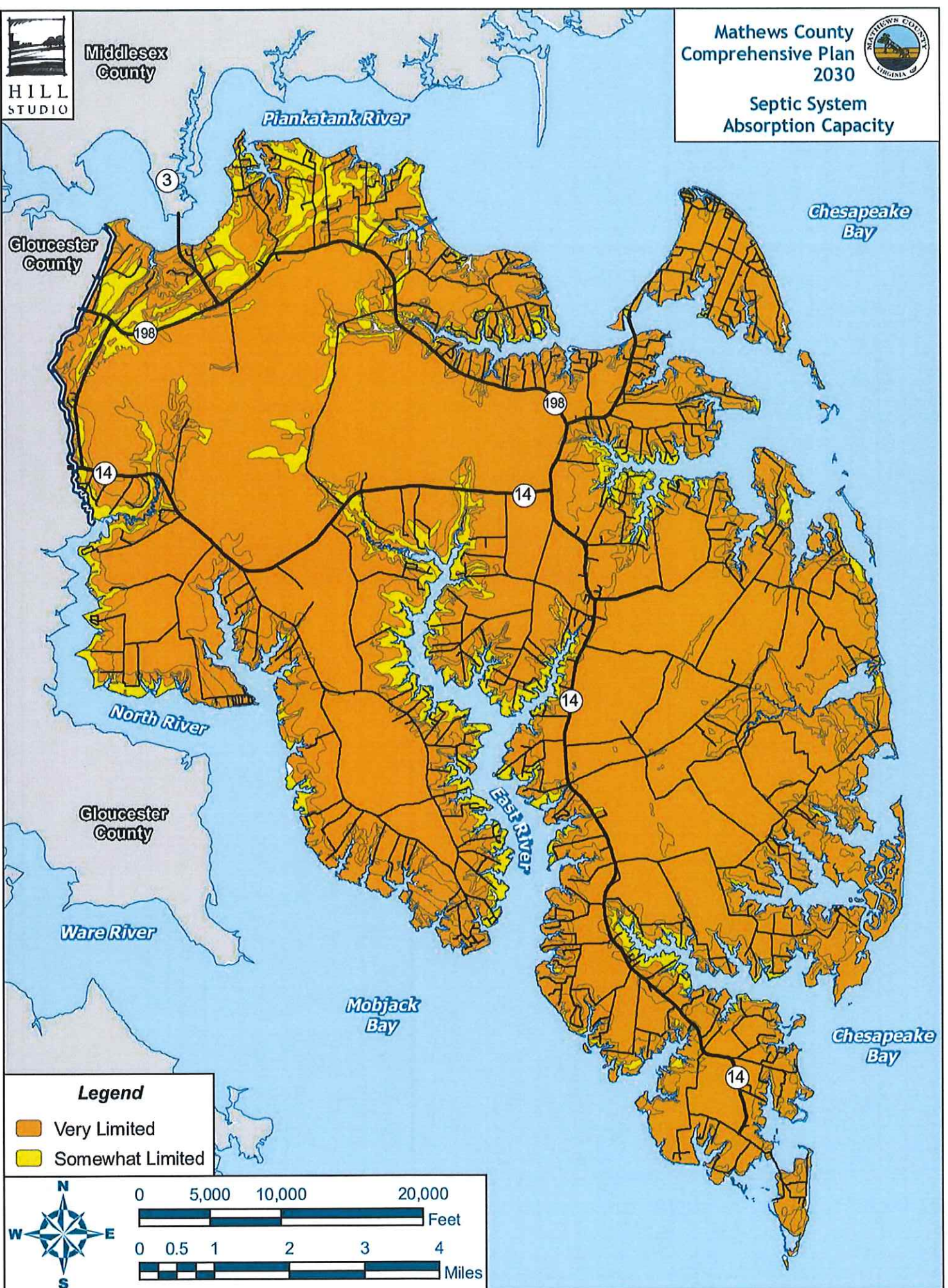


Middlesex
County

Mathews County
Comprehensive Plan
2030



Septic System
Absorption Capacity





**IV. Mathews County Today and Tomorrow:
Conditions, Opportunities, Policies and Strategies**

Access to the Waterfront

Mathews County is extremely fortunate to have over 280 miles of shoreline. This tremendous asset is highly valued by residents and County officials because of its contribution to the area's quality of life, recreation, and local economy. In 2003, the County adopted a *Staterwaters Access Management Plan* that provided information on all public access areas and marinas throughout the County. The plan also includes specific recommendations and priorities for improving public facilities. More detailed information on this waters access plan is found in the preceding section, Public Facilities and Services (Recreation).

The Middle Peninsula Chesapeake Bay Public Access Authority (PAA) was created by the General Assembly in 2002 in an effort to increase public access to the Chesapeake Bay. The PAA Altruistic Giving Program has acquired hundreds of acres of privately donated waterfront property in localities throughout the Middle Peninsula including Mathews County. Property acquired by the PAA is used for public waterfront access and recreation which helps to improve the quality of life of local residents while supporting the tourism sector of the County's economy. Waterfront properties donated to the PAA are also conserved and generally restricted for development thereby serving as a natural buffer and filtration system. The PAA works with local governments including Mathews County to ensure that donated lands are used in compliance with local codes as well as in keeping with the natural environment of the communities. The PAA and the county have worked to formulate and implement a plan for the use of Mathews Heritage Park, a public waterfront access site donated to the PAA and located in the Moon area.

Climate Change

In recent years, there has been continued discussion about climate changes that are being experienced around the world. While there are varied opinions on causes and ultimate effects, it is recognized that changing weather patterns may contribute to rising sea levels which could significantly affect both inland and coastal communities. Regardless of the causes of climate change, as well as the pace and magnitude of such changes, it is essential that communities appropriately plan for changing trends and adjust their development patterns to minimize potential adverse impacts.

Sea level rise in conjunction with shoreline erosion and coastal subsidence (or sinking) is a concern for coastal Virginia. This is especially important for populated areas in terms of property damage and safety concerns as well as in terms of potential impacts on natural communities responding to changes in vegetative patterns, wildlife populations, and chemical responses due to temperature variation, runoff, varied rainfall, etc.

Intense development patterns, rising sea levels, along with the potential for stronger storms pose increasing threats to coastal communities, infrastructure, beaches, wetlands, and sensitive ecosystems. With respect to the mid-Atlantic region, rising water levels, erosion and coastal subsidence are already affecting low-lying lands, eroding beaches, converting wetlands to open



*IV. Mathews County Today and Tomorrow:
Conditions, Opportunities, Policies and Strategies*

water, and exacerbating coastal flooding. Consequently, the County should consider additional approaches for adapting to a changing coastline. Short-term structural solutions (e.g., rip-rap revetments, breakwaters, bulkheads, elevating structures, etc.) will not sufficiently address all anticipated changes. Shifts are needed in federal, state and local policies with respect to more long-term land-use planning and environmental protection and preservation. *County efforts, such as the recurrent flooding study project, currently underway with the MPPDC, is an example of an approach to addressing the flooding and sea level rise impacts through local policy changes. A combination of local land use tools, financial incentive programs and/or acquisition and conservation programs are being deployed by coastal jurisdictions to manage the impacts of flooding due to sea level rise. The ultimate decision moving forward on the issue will be determined by the County's objectives in balancing the economy, respecting private property rights, and protecting local infrastructure while preserving the environment.*

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